The Commercial Car Journal

VOLUME XIV PHILADELPHIA, OCTOBER 15, 1917 NUMBER 2

Northwest Bakers Utilize Motor Trucks

By WARREN EUGENE CRANE

THE bakers of Seattle and vicinity are using commercial cars as units in their delivery systems with excellent results. There are three prime reasons for their superiority over horses: First, they are more economical because of the soaring cost of oats and hay. Second, they can cover twice as much territory in a given time. Third, they make it possible to furnish the grocery and consumer prompt and efficient service—especially when hurry-up calls are received.

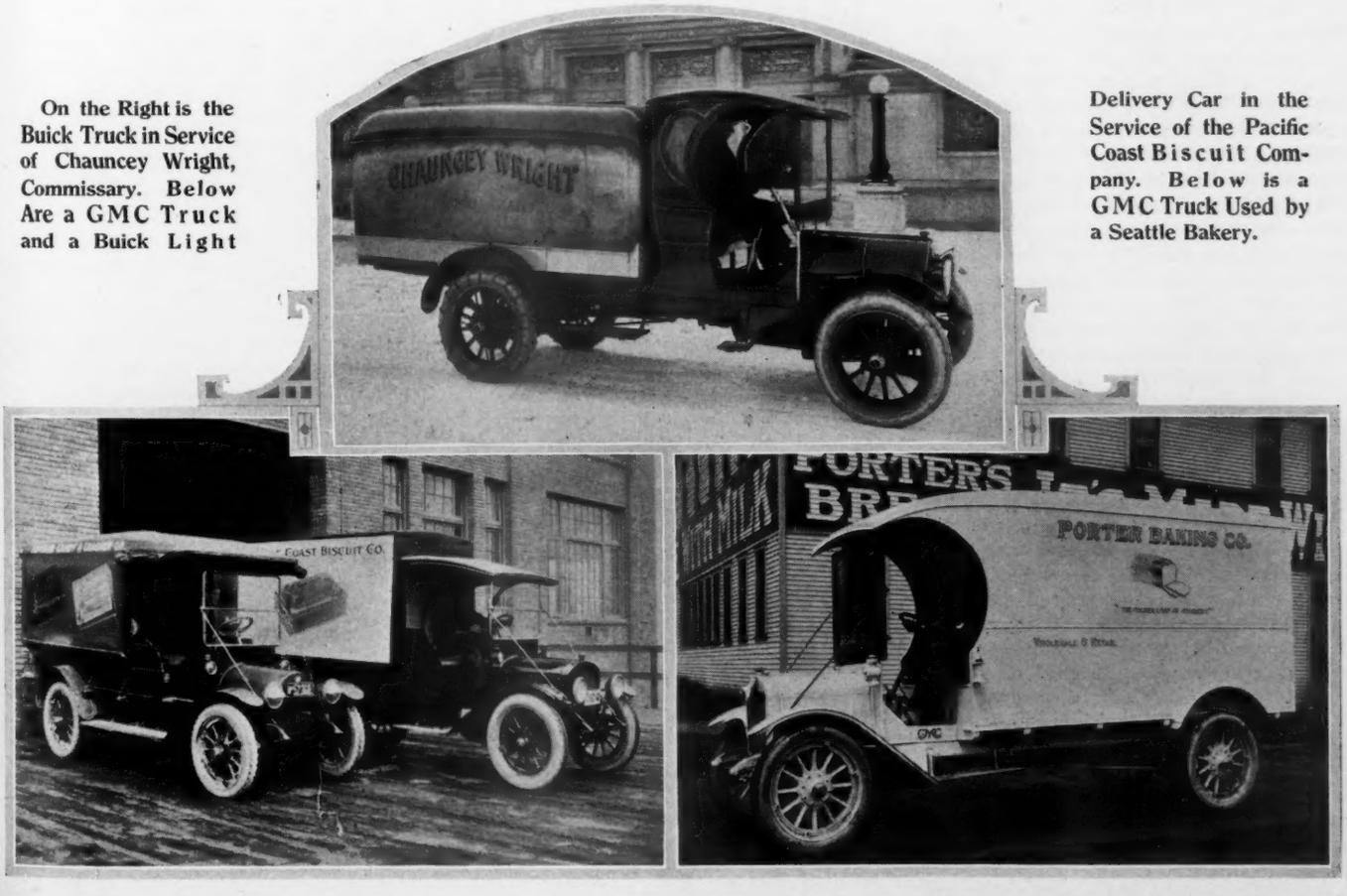
The Hansen Bakery Co. uses five Ford light delivery cars in carrying its bread to the various groceries and restaurants at a cost of four cents a mile. They divided their territory into six parts, as follows: Route 1, University District, Cowen Park and Ravenna Park; route 2, Fremont, Edgewater and Green Lake; route 3, Ballard; route 4, Down Town Route; route 5, Queen Anne Hill, and route 6, Eastlake Ave. district, north of Pike St.

"We find the commercial car very satisfactory in our business," said J. L. Hansen, the manager. "They cover double the territory that horses can and there is very little difference in the expense."

The Three Girls Bakery is a unique institution with a growth that is phenomenal. Only four years ago three young ladies, Miss Hill, Miss Johnson and Miss Lynch, started a small restaurant and bakery, known as the Golden Pheasant, at 1119 Pike St. They baked such fine home-made bread and layer cakes that people began to stand in line to buy them.

At this time, T. L. Monson, a Seattle advertising man, called upon them and suggested the name of the Three Girls Bakery, which they adopted. The restaurant was discontinued and a company was formed, of which O. F. Fredericks became one of the leading stockholders and general manager. A big daylight bakery was built and the capacity was increased from forty loaves to 5,000 loaves a day. The company purchased five Republic and two G. M. C. trucks to handle its delivery districts, which were divided as follows: First, University District and Ravenna Park; second, Georgetown and West Seattle; third, Mt. Baker Park and Rainier Valley; fourth, Queen Anne and Ballard; fifth, Capitol Hill and Broadway District; sixth, Down Town; seventh, the company's own stores.

"An important thing that every baker should consider is the fact that each small load going a short distance is carried at a loss," said O. F. Fredericks, the manager. "The head of the delivery system should be very careful to arrange his districts so that each car can cover it without doubling



On the Right is the Buick Truck in Service of Chauncey Wright, Commissary. Below Are a GMC Truck and a Buick Light Delivery Car in the Service of the Pacific Coast Biscuit Company. Below is a GMC Truck Used by a Seattle Bakery.

its trips. One of the prime reasons for the bankruptcy of many firms is their high delivery costs. I knew one merchant who often used a dollar's worth of gasoline to deliver twenty-five cent orders. Needless to say he was soon forced out of business.

"The man who considers buying a motor truck should be very careful to find out the kind of service that the various companies give. He should make that his primary consideration. He should find out whether they have a sufficient supply of parts on hand and whether they habitually overcharge for repairs and accessories. It would be better to pay a little more at first for a truck if one had the assurance that he was to be fairly and honestly treated by the dealer.

Modern Machines Economical

"Our operation costs vary from six to eight cents a mile on machines which we now have in service. I believe that the factories should fix the maximum retail prices for their parts so that the agents can not overcharge the truck owners."

The Porter Bakery Co. specializes on a "direct-to-the-consumer" system of business. It operates one ¾-ton G. M. C. truck, three Ford trucks and twenty-five wagons. It uses its motor cars for its wholesale trade with the different grocers and its horses and wagons in calling upon its residential trade.

"When we opened up our bakery in Seattle, about a year ago, we had a big problem to face," said G. G. Porter, president of the company. "We had the choice of slowly building up a business on a wholesale basis, exclusively, or on a combination of both wholesale and retail. We finally decided on the latter and our growth has been phenomenal. We use horses for our house-to-house trade with good results, because the horse often knows the route better than the deliverymen, who are constantly changing. The horses, however, are not capable of standing up under the strain of the long, heavy hauls and steep hills that we must negotiate in covering our wholesale routes. Therefore, motor delivery has been most satisfactory as a means of carrying big loads of bread to the various groceries, which are located a long distance from our bakery."

The Davidson Baking Co. operates four White motor trucks and three Ford light delivery cars for distributing bread from its model bakery to the various grocers of Seattle. It has divided the city into the following routes: First, Down town district; second, Ballard, Fremont, Ross and Green Lake; third, Mt. Baker Park, Rainier Valley and West Seattle; fourth, Queen Anne Hill; fifth, University district and Madison.

"We use distillate in all our machines with excellent results," said H. C. Davidson, vice-president of the company. "We have fitted all of them with priming devices or special carburetors with that purpose in view. Every night we put a tablespoon full of gasoline in the priming cups of each machine, so that it is ready for work in the morning. It is especially important to do this in the winter when the temperature is low. Our trucks have been an important factor in the growth of our business. We have been able to distribute our bread more promptly and on a larger scale than we could have done if we had confined our efforts solely to horses."

The Pacific Coast Biscuit Co. delivers baked goods to the groceries and lunch rooms of Seattle in two 1-ton Buick delivery trucks, two 1-ton G. M. C. trucks and one 1½-ton Federal truck.

"We find that motor trucks are great money savers," said Thomas P. Blackler, manager of the company's Seattle branch. "They also save us a great deal of time. Furthermore, horses are not able to travel quickly up the steep hills with heavy loads. We are convinced that motor cars and trucks are the most practical and swift mode of distribution yet devised."

The bakeries of the Northwest are increasing the number of motor trucks in their service very rapidly, because they are more powerful, economical and expeditious than horse-drawn vehicles.

Motor Truck Moves Goods Cheaper Than Railroad

C. Bert Query, proprietor of the Capitol City Transfer Co., Olympia, Wash., is in the moving and cartage business. He holds the moving record on the Pacific Coast for transporting contents of houses from Olympia and contiguous points to Seattle, Tacoma and northern points in the state. In one instance, Mr. Query says, he moved furniture in single loads from Olympia to Seattle, a distance of 90 miles, at an expense of about 25 per cent. less than by rail. Not only can delays be avoided by moving overland by truck instead of by freight cars, but the time taken is less and the expense of cartage at both ends of the journey on the railroad makes the cost greater by that means. Truck moving is less severe on crockery and perishable goods than by freight car hauling. Mr. Query is using a 3½-ton standard truck and a 1½-ton GMC, and expects within a short time to put on several more trucks to take care of his business. Hardly a day goes by that he does not have several inter-city trips.

C. M. Lowe, of Sunnyside, Wash., is also specializing in inter-city trips. Mr. Lowe says: "Before I bought my truck my hauling equipment consisted of teams and my work was confined entirely to Sunnyside and immediate vicinity, handling coal, wood, lumber, furniture and general hauling work. A year ago I got to studying the hauling situation and decided that the day of the truck had arrived, and the way my business has increased since I got the truck is simply wonderful. Soon after putting the truck into operation, my radius of operation extended till I was making trips all over the territory near me. Some of the hauls run up to 60 and 80 miles. Besides my general hauling, I began to get jobs hauling wheat. Part of last season we worked 24 hours a day with two drivers for the truck, and 18 hour days are not unusual for us. We couldn't begin to do it with horses."

DOBLE LABORATORY, San Francisco, Cal., announces that it has no connection whatever with any other concern. The company is now at work on the production model of its standard 2-ton truck. Production of this size will be taken up immediately upon the completion and testing of the production model, after which a 1500-lb. special utility car will be brought out. A 3½-ton truck will also be brought out later. No commercial pleasure cars will be brought out, but orders will be taken for special cars of the very highest grade.

ACCORDING TO T. TANAKA, of Tokyo, Japan, while in Lansing, Mich., to inspect the four-wheel drive Duplex truck, there is a big market in Japan for heavy duty trucks. Mr. Tanaka states that there are many undeveloped mines in that country and road construction is just starting. At the present time, work is progressing slowly and expensively because of the few labor saving devices that have been brought into the country. There are not more than 50 heavy duty trucks in Japan at the present time, but there has been almost phenomenal change in Japan since the beginning of the war.

AMSTON MOTOR CAR CORP., Amston, Conn., has purchased the property assets of the Sterling Automobile Mfg. Co., New York City. The new company, organized under the laws of Connecticut, with a capitalization of $3,000,000 worth of common stock, will operate its own plant in Amston and will primarily build a ½-ton delivery wagon to sell at from $900 to $950. A roadster, 5-passenger and several closed types of cars, selling at $900 to $1000, will also be built. Temporary offices have been opened at 101 Park Ave. Chas. M. Ams is president and general manager of the new concern.

The One and a Half Ton GMC Truck Being Used by C. Query, Olympia, Wash., to do Long-Distance Hauling.

War's Effect on the Motor Truck Industry

How Existing Conditions Have Been Brought About and What Should be Done and What May be Expected While the War Lasts

By S. V. NORTON*

THE first effect of the war was a general hesitancy—Americans, unfamiliar with the political interests and policies of the belligerents, could not grasp the nature of the struggle. It was almost as though they looked on, appalled, holding their breath in surprise and horror. This hesitancy, so far as the motor truck industry was concerned, lasted but a few weeks, however, after which it was followed by feverish and intense activity. Germany, prepared with every device that skill and industry could provide, had not only guns, ammunition and supplies of all kinds, but her motor transport was complete and ready for action, even to the signs painted on the sides of their bodies, reading "On to Paris!" The Allies, however, unprepared for the blows they were to receive, and unable to mobilize their forces quickly, due in part to their lack of motor trucks, immediately entered American markets.

This unusual foreign demand, which increased tremendously for the first eighteen months of the struggle, reduced the supply available for domestic use, since almost every truck manufacturer either had large foreign orders or sold trucks to export commission houses in New York, which were clever enough to engage steamer space, already at a premium, and "sporting" enough to agree to deliver the trucks abroad, notwithstanding the unusual risks of loss in crossing.

Allies Started the Truck Buying

Not only did the Allies buy American trucks, however, but they bought large quantities of all sorts of supplies needed by their fighting forces. This meant that almost every industry in the United States became taxed to its capacity. Moreover, trucks were needed in all lines of business to speed up deliveries, which, of course, were of the utmost importance in stemming the Teuton invasion. In fact, so much depended on getting material promptly to Atlantic ports that trucks began to compete with railways for long distance hauling, where the highways were good enough. This unusual demand for trucks resulted in the formation of new companies to manufacture them, while those already established became very busy, many of them working day and night. The demand was further stimulated by the frequent embargoes placed on freight over railways, and the car shortage due to the difficulty of getting the empty cars from the Eastern yards to the central parts of the country.

The high-water mark in the demand for American trucks passed with the gradual development of trench warfare, since it became possible to supply the entrenched forces from rail heads, which ran comparatively close to the front, and there was less need for carrying supplies and equipment over territory which was being traversed by troops under forced marches or retreats. It is fortunate that the extreme need for trucks declined during this time, for the destruction of ships by submarines began to increase the freight congestion, and it became increasingly difficult to secure space to ship trucks abroad. As the domestic demand continued strong, however, truck manufacturers continued to build large quantities which found a ready market in the United States. Thus it will be seen that the effect of the war on the motor truck industry before the United States became a belligerent was to give it two years and a half of most remarkable growth and development.

When at last the German government, by its continued insolence and brutal disregard of American rights, both on land and sea, caused the United States to recognize the state of war already existing between the two nations, there were certain very wholesome and tangible effects upon the relations between government and business interests in general. Germany regarded as an asset the general unpreparedness in this country and thought that she would win victory before the United States could become a factor. However, she failed to understand the temper of the people and overlooked entirely the amazing genius of American business men for organization The President, at a stroke, summoned to his aid and that of his Cabinet the leading business men of the country through the creation of the Council of National Defense.

What Our Economic Problem is

The economic problem we face, in its simplest terms, is this:

1. What supplies will we and our allies require to defeat the Central Powers?
2. How can these requirements be met?
3. What can be done to keep business conditions as nearly normal as possible while we are meeting these requirements?

With a view to solving this problem quickly and efficiently, the great corporations of the country are working in close contact with the officials of our government, and both interests are anxious to see that legitimate business is not hampered.

Having made this survey of the effect upon the relations between business and government, let us see how the war will affect the demand for motor trucks. What will be the government requirements, including those of our allies? Since the present demands of England, France and Russia have been noticeably reduced by the comparative inactivity of trench warfare, and they have standing orders with two or three American truck manufacturers who have been making regular shipments abroad almost since the outbreak of the war, it is the present intention of the Government to allow these sources of supply for our allies to remain undisturbed. The sending of an American expeditionary force to Europe, however, injects an entirely new factor into the industry, with the exception of the limited experience we had with trucks in Mexico.

Trucks Must Go With Our Army

It seems to be the present intention of the Administration to send an initial force of at least 650,000 men to the front as soon as they can be trained and equipped. These troops will be transported, provisioned and cared for absolutely independent of our allies, and perhaps half of the 75,000 motor trucks, bids for which were opened in Chicago on June 10 last, will be purchased as soon as they can be obtained, to meet these immediate needs. Although the specifications adopted by the Motor Transport Division of our Quartermaster's Department call for trucks which differ in certain respects from those made for ordinary commercial requirements, it is not expected that the new Government standard machine can be built in large quantities immediately. For the present it is my opinion that the trucks required for our army will be bought from a comparatively small number of manufacturers whose trucks have been tested in army service and found satisfactory.

I do not expect to see the Government commandeer private trucks, although I understand the army officials are in possession of complete lists of the names and addresses of owners of all trucks of certain makes, and could, if necessary, assemble large fleets for emergency use. This will probably not be done, however, as it is thought best not to disturb existing business any more than is absolutely necessary.

In addition to the trucks required by the Transport Division, the Signal Corps will require machines with special bodies and devices for their peculiar needs, such as trucks for field wireless stations, airplane and balloon conveyors, etc. In the Surgeon General's Department, where many hundreds of ambulances will be required. I understand that for the sake of efficiency in their operation and maintenance these will be confined to but two or three different makes, for which orders have already been placed. The miscellaneous uses to which trucks and cars will be placed are

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THE COMMERCIAL CAR JOURNAL is the only truck journal a member of the Audit Bureau of Circulations—"There's a reason."

too numerous to mention. An interesting, concise and authoritative summary of the part played by automobiles, trucks and airplanes in the war is an article in the *National Service Magazine* for May, 1917, called "Mechanical Transport in Modern War," by Major Palmer E. Pierce, a member of the General Staff of the United States Army.

The next question is how the war will affect the demand for trucks for commercial requirements. In spite of the upheaval in almost every normal activity in business due to this world crisis, the normal demand for trucks, it seems to me, will continue and be augmented during the war at least, and probably for a considerable period thereafter, by several important factors. Among the causes contributing to this increased demand are the following:

1. *General business activity* throughout the country, including increased output of war materials. As prompt and dependable deliveries are important, trucks will be sought more than ever to supplement present methods.

2. *Shortage of Horses.* According to statistics compiled by the National City Bank of New York, there are approximately 100,000,000 horses in the world, of which about one-third are in Russia and one-fifth in the United States. The Russian supply by reason of war conditions is almost wholly unavailable, except for her own armies. Hence our allies have been obliged to draw upon us for their requirements. Since the beginning of the war about 35,000 horses and mules have been exported per month to the allies. In addition to this drain on our domestic supply, it is estimated that "eleven thousand a month will be needed to keep our flag advancing as fast as the others." A military authority in Washington told me that approximately 5,000,000 horses and mules had been killed thus far in the war. It requires but little effort of the imagination to foresee that the effect of this shortage of draft animals will noticeably increase the demand for motor trucks as a substitute.

3. *High Cost of Horse Fodder.* J. Arthur Bell, of the Bureau of Animal Industry, Washington, has estimated that the horses in the United States consume over two billion dollars' worth of hay and grain each year. With the constantly increasing cost of labor, this immense animal food bill must be curtailed. One of the surest ways of doing it will be to substitute the relatively much less expensive motor truck.

4. *Increased Crop and Food Production.* We are all familiar with the efforts being made to increase the amount of food produced in the United States. Already we are beginning to get reports from government authorities that many crops will be larger than ever before. Since these increased crops must be moved and the supply of horses is diminishing, it seems logical that farmers should buy motor trucks as well as tractors. In fact, truck manufacturers have told me that sales in agricultural districts are increasing.

5. *Congestion of Railways.* Daniel Willard, president of the Baltimore & Ohio R. R., and chairman of the Advisory Commission of the Council of National Defense, recently said: "The railroads of the United States, operated as one system, are carrying more freight than ever before in the history of the country, but when they have carried traffic up to 100 per cent. of their capacity there still remains 15, 25, perhaps 30 per cent. of traffic which it is impossible for them to carry at all." When future plans are considered, it is easy to understand his statement. Large bodies of troops and their equipment must be moved in this country. The United States army in France will require a regular and uninterrupted flow of munitions and supplies from our industries to our seaports, while the new cantonments for training the National Army will require hundreds of carloads of materials for their successful establishment and maintenance. It will be absolutely necessary to use existing means of transportation for essential things, and we should willingly give up the non-essentials. Under these circumstances the demand for more trucks will be insistent to relieve the congestion of the railways.

6. *Proposed Use of Waterways.* The Department of Commerce is now working out a plan for the use of existing waterways. In a statement issued June 14 the Secretary of Commerce said, in part: "It is necessary that every possible use be made, both for local and through freight, of all interior waterways, canals, rivers and lakes, and this must be done not only as generally but as quickly as possible if we are to escape serious congestion. There is more than sufficient business for both railway and waterway for many months to come. Wherever, therefore, throughout the country a barge or a boat, a scow, a lighter or a motor vessel can be made to take the place of a railway car it ought to be done." If this plan is actually accomplished, motor trucks may be made to play an important part at shipping and receiving points, covering, as they might, effectively a range of tributary territory with a radius of forty to seventy miles.

7. *Probable Construction of Military Roads.* The increasing dependence of the belligerents in the war upon the use of motor trucks has convinced Americans of the need for adequate strategic military highways in this country. Several of the Eastern States have already started to make surveys of their needs in that respect, in conjunction with the Engineers' Department of the army. It is probable that military highways suitable for the use of heavy duty trucks will be constructed through the employment of convict labor. These roads and others now in process of construction will act as a strong incentive for the extended use of motor trucks.

In addition to these specific reasons for the probable increased demand for trucks, the splendid performance of the trucks now in service and the educational work done by the truck companies has resulted in a growing recognition of the need for more efficient methods of transportation, which will be increasingly apparent in the future.

If then the demand for trucks is increased by both government and commercial requirements, how will the truck manufacturers meet the situation? In the first place it is apparent that the increased demand will stimulate the total output of trucks throughout the country. Established manufacturers will build more trucks and fewer pleasure cars. New manufacturers will continue to enter the field, for the market will absorb more than all the trucks that can be built for a long time to come. New types of trucks will appear, if we may judge from what has happened. In England alone seventeen makes of trucks driven by steam are now sold, while those using kerosene are also rapidly increasing. Used pleasure cars will be converted into trucks through the use of driving units especially built for that purpose. Finally the electric truck will be built in larger quantities than ever before, due to its ease and economy of operation, the increasing scarcity and high cost of gasoline and the fact that there is almost no likelihood of electrics being commandeered by the government, since its range of effective operation is comparatively limited for military purposes.

Truck Delivery Will be Hindered

This increased total output of trucks will probably have several important results. In the first place there will be an increasing shortage of parts, such as motors, axles, transmissions, etc. Hence more truck manufacturers will make their own parts. Next there will be an increasing shortage of labor due to the demands in all industries as well as the withdrawal of men who must go to the front. The selective draft will probably protect the manufacturers of trucks and parts, to a large extent, since motor trucks are regarded as military necessities. Nevertheless the shortage of labor will be very severe. Another result will be higher prices for finished trucks, due to the higher costs of materials, labor and distribution as well as increased war taxes. Finally the most annoying result will be seriously delayed deliveries, due to the various war conditions already mentioned. It is therefore my suggestion that those considering the purchase of trucks should immediately place their orders, for they will find it increasingly difficult to obtain deliveries in the future.

The increased demand for trucks and the attempt on the part of the makers to meet it will probably bring about improved methods of manufacture, in order to make possible a greater output and to offset rising costs of all kinds.

The trucks used in the army will require drivers who have had at least some experience, and it is thought that the selective draft will make it possible to recruit drivers from those now in that business. This may cause a temporary shortage for commercial purposes which will be intensified

"Those considering the purchase of trucks should immediately place their orders, for they will find it increasingly difficult to obtain deliveries in the future"

by the increased sale of trucks, all of which will, of course, require drivers. To help truck owners adjust themselves to this future shortage of drivers, as well as to assist in eliminating unnecessary waste in retail deliveries generally, the Commercial Economy Board, a sub-committee of the Council of National Defense, has been considering various methods which might be employed. This whole movement seems to open unusual opportunities for the establishment of co-operative delivery systems of all kinds, thereby avoiding useless duplication. In England the business of motor haulage contractors who sell delivery service has grown to large proportions during the war. If the course of events in this country follows that of our allies, the shortage of drivers will lead to the employment of older men and possibly women.

Another important effect of war conditions will be a noticeable reduction in the supply of gasoline, due to the unusual requirements of the army and the increased commercial consumption. One of the largest refining companies has cancelled orders calling for two and a half million dollars' worth of construction work for extending its service, due to the fact that they expected to turn over a large part of their output during the war to the Government. The shortage of gasoline will undoubtedly lead to higher costs, the substitution of cheaper fuels and the increased use of electric current.

In general rising costs will be encountered in every phase of motor transportation. This will tend to develop economy and efficiency in management. Truck owners will begin to study costs to prevent waste. Mechanical supervision of trucks by recording devices will become more general and many of the abuses to which trucks are now subjected will be eliminated. Bonus systems for drivers will be tried and adopted because of their tendency to develop economical operation. In short, the dominating thought among intelligent truck owners will be to make use of every available means of promoting efficiency and economy.

Postmaster Favors Motor Truck

IN the opinion of the Postmaster General every large city and the villages and farming communities about them should be interested in the passage of the bill introduced in the House by Mr. Moon, authorizing experiments by the Postmaster General in the operation of motor truck routes in the vicinity of large cities.

In the view of the department the operation of these motor-truck routes, as contemplated by the bill, would add a hundred per cent. to the value of the parcel-post service in the vicinity of the cities where established.

The purpose of the bill is to have tried out a plan by which the benefits of the millions of dollars expended in making good roads and in the great development of motor vehicles may be cordinated with the parcel-post system, so as to open up great stretches of country within easy motor distance from large cities and to facilitate the delivery of food products.

About many of the large cities, within a radius of 50 miles or more, there are productive districts occupied by farms and villages which are without direct postal facilities. These would be reached by the contemplated motor-truck routes, to the convenience and advantage of both the isolated communities and of the consumers in the cities.

Would be Self-Supporting

For example, the City of Pittsburgh, one of the greatest centers of commercial and productive activity, is surrounded in almost all directions with productive territory, the inhabitants of which have no direct postal facilities, and must drive many miles to the city for their mail or the delivery of their produce. A similar condition exists as to most of the large cities where the divergence of railroad systems leaves large areas of country lying between and remote from the railroads. Generally these sections may be reached by good wagon roads, millions having been spent in various States for road building.

By the use of motor-truck routes in the Parcel Post Service in these sections it is believed a very large amount of food products which otherwise would be wasted or delivered only at very high cost would reach the large cities at a reasonable cost to the consumer. It is estimated that such service would be self-supporting and perhaps profitable to the Government.

Will Give More Privileges

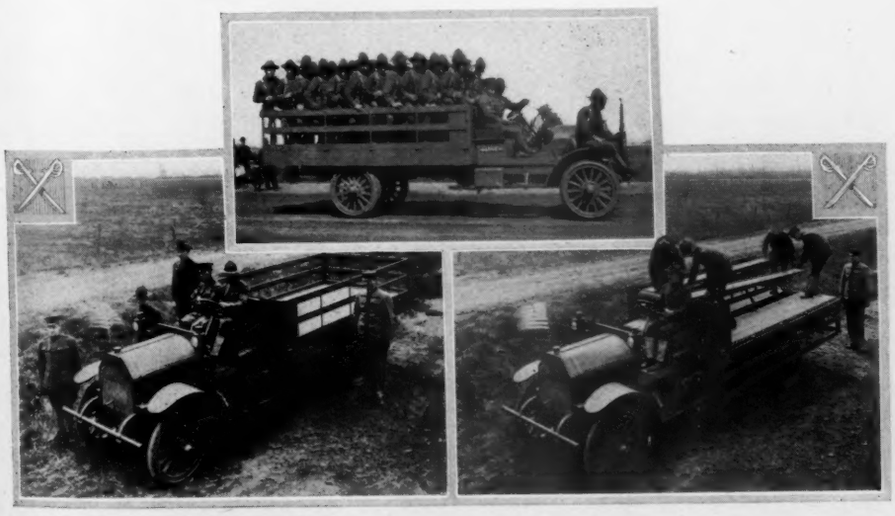
In support of the measure Fourth Assistant Postmaster General Blakslee says that if the experiment is a success it will provide a direct means of communication and conveyance between mailing patrons in cities and rural territory that it is not possible to provide at a minimum cost to the Postal Service or to the patron at this time.

It will assist in the effort to reduce the cost of living by eliminating useless and expensive operation in the postal means of communication between producer and consumer.

It will permit the producer to continue production and the labor incident thereto instead of suspending production or labor while conveying produce to consumers.

It will extend the postal zone of collection and delivery service in the vicinity of large cities to the point where the actual farmer producer is domiciled rather than to where only suburban residents and non-producers live.

The postal patron in any of the 50 largest cities in the United States will directly benefit from the increased service and improved methods of communication with the genuine rural population and vice versa when the proposed legislation shall have been enacted and the maximum facilities provided. All other communities, wherever found, likewise and in proportion to their population.



The Harvey Army Transport Truck. It is Shown in Its Various Stages: As a Platform Body With Special Hinged Sides; Being Converted Into a Transport; and With Capacity Load

The Harvey Motor Truck Works, Harvey, Ill., manufactures this unique truck and body, which was described in the June 15, 1917, issue of the Commercial Car Journal, page 54

Asks That Horses be Banished From Public Streets

Erwin Greer, president of the Erwin Greer Automobile Co., Chicago, has written to Mayor Thompson asking that the horse be banished from the streets. In part he states: "The present era of motor transportation has ended the usefulness of the horse. Economy demands the greatest saving in both time and money. Such an ordinance has been passed in Berlin, and London and Paris are contemplating similar legislation. The horse obviously has outlived its usefulness and progress demands it be kept off the streets. The method of abolishing the horse is worthy of the support of all progressive citizens."

Interesting and helpful information; reputable advertisements—that's the CCJ

Photos From Kadel & Herbert

Pictures From the Front, Showing Use of Motor Trucks in Warfare

1. Blue Cross ambulance for wounded horses has reversible pivoted body, so horse can walk in and walk out forward. 2. French anti-aircraft gun on motor truck. 3. Shells being transported from the factory to the front, by motor trucks. 4. American troops landing "Somewhere in France". 5. War motor car built by Studebaker, carries two machine guns and their equipment, twenty thousand rounds of ammunition, tools, water, gas and oil, field rations and seven soldiers besides the driver. 6. Belgian armored cars ready for action. 7. Armored observation automobile, built by the Marino Brothers. The tower is 25 ft. high, and can be folded. Can also be used for sending wireless, or for mounting a machine gun. 8. American troops being taken to their barracks in French transports, driven by French drivers. 9. French tanks advancing on German trenches. 10. New French tank just back from a raid, being hid under the trees.

Review of the Gasoline and Oil Situation*

Consumption is Exceeding Supply but Increased Production is Possible by Drilling New Wells

By A. C. BEDFORD†

UNDER the general heading, "How American Industry Can Help Win This War," the topic assigned to me is "Priority and Distribution." The matter of distribution, of course, involves supply and conservation. I can speak on any such topics only in so far as they include affairs within my own experience. Perhaps, a statement of the concrete experience and problems of the industry with which I am identified may have lessons which will prove illuminating to other industries. Therefore, without attempting to deal in generalities with reference to the relationship of American industry to our Government in its efforts to win the war, I shall attempt to tell you something of what the petroleum industry is doing in that direction, and what more must be done if the efforts of the petroleum industry are to be completely successful.

Fundamental Problem is Supply

The fundamental problem confronting the petroleum industry is that of supply. Next to an ample quantity of munitions of war and food, nothing, with the possible exception of coal, is so absolutely vital to winning this war as petroleum and petroleum products.

They tell us the war is to be won in the air. Our country is said to be building large numbers of aeroplanes. Our Allies are building flying machines as fast as they know how. Vital to the very existence of these aeroplanes is the highest grade of gasoline which can be produced.

We are to send great armies to Europe to supplement those of our Allies. They say that four tons of material must be shipped for every soldier transported. In France most of the transportation must be done by motor lorries. When our army is fully equipped, some 35,000 motor lorries will be required. These will require gasoline and lubricating oil in large quantities.

Our Government is building at the greatest possible speed merchant ships and men-of-war. We have appropriated hundreds of millions of dollars for the gigantic task before us. These ships will call for fuel oil, lubricating oil and gasoline to an extent beyond any precedent.

To protect our coast against submarines, our navy has created a Mosquito Fleet, consisting in a large measure of motor-boats. There are thousands of motor-boats operated in American waters, although, of course, not all are for purposes of national defense. The operation of every such vessel, whether for pleasure or for strategic purposes, calls for a continuous supply of gasoline and other petroleum products.

Our Allies, too, are calling for oil in all its forms in ever-increasing quantities. In 1915 this country exported about 5,000,000 barrels of gasoline, whereas in 1916, 7,120,000 barrels were sent abroad.

Munition cars, ambulances and self-moving vehicles of every kind are increasing daily in the theatre of war, and the prospect is that the present year will call for 8,000,000 barrels of gasoline for the use of our Allies in Europe.

Our Allies also look to us for the bulk of their supply of fuel oil, and petroleum products of every form for the use of their merchant ships, their navies and their armies. With the Galician and Roumanian oil fields in Europe in the hands of the Central Powers, and with the available supply of Mexican oil reduced by reason of the shortage of shipping tonnage, the United States is the largest and nearest source of supply for the oil in all its forms, which is so absolutely necessary to win this war.

Government Must Come First

And let me say right here, that this war must be won. No American who appreciates his birthright can falter or be faint-hearted for a moment. The very existence of free institutions depends upon the success of the Allies in this struggle. No matter what our bias may be in domestic politics, no matter what may be our views on this or that policy in our own national affairs, we can have but one view as to our obligation to support our own Government —to support the Administration in control of our Government, in every way in our power to help win this war. That is the spirit in which the oil industry is working; it is the spirit in which every other industry of this country is working. The vitally important thing is that that spirit should be intelligently directed and should bend its efforts along lines which will be completely effective in the national interest.

I have given some indication of the needs of our own Government and our Allies for petroleum and petroleum products necessary in the actual conduct of warfare. Many of these uses are entirely or relatively new; others are upon a scale hitherto undreamed of. Certain it is that all of them call for an ever-increasing supply of petroleum.

And the demand for petroleum and petroleum products is not alone in the actual conduct of the war. Up to relatively a few years ago, the chief use of petroleum was for kerosene and lubricating oil. With the development of the internal combustion engine and its adaptation to the automobile, we found an entirely new use for gasoline, which, up to that time, had been considered an unimportant by-product of crude petroleum. Now it has come about that the chief value of petroleum consists in its gasoline content, and while England and our Allies are calling in loud tones for more ships, and more ships, the world of warfare, of trade, and of pleasure, are calling in ever-higher tones for more gasoline and more gasoline.

The increase in the number of automobiles manufactured in the United States has been little less than miraculous. In 1899 there were 10,000 motors in this country. In 1905, only 85,000 cars. Yet by 1914 there had come to be 1,253,854 cars, and by the 1st of July of this year, approximately 4,000,000. The production of gasoline, brought about by this extraordinary demand, jumped from about 6,000,000 barrels in 1899 to some 45,000,000 barrels in 1916, and will probably be over 50,000,000 barrels in 1917.

In addition to all the demands for gasoline, there has been a great call for petroleum for fuel oil, for road-making, for use in farm tractors, and for use in small farm engines. Every part of the oil is being put to some useful purpose, and the value of the by-products is increasing day by day.

In response to the demands thus created, there has been tremendous development in the production of crude oil in this country. The consumption of crude in 1904 was 117,000,000; it rose steadily to 324,000,000 barrels in 1916. For several years prior to 1916, the production of petroleum in this country had been in excess of the consumption. In 1916, whereas over 308,000,000 barrels of crude oil were produced in the United States, the consumption amounted to over 324,000,000 barrels of crude oil of American production. In addition to this 324,000,000 barrels, we absorbed in this country 23,000,000 barrels of Mexican crude.

Important Figures for Half of Year

The figures for the first six months of the present year are highly illuminating, and present a picture which it is the duty of every one of us to consider carefully. The figures available for the first six months of this year show that the rate of production of crude oil indicates a total production for the year of 312,000,000 barrels, whereas consumption was going on at a rate of approximately 330,000,000 barrels for the year.

On January 1, the amount of petroleum in storage in the United States was 174,370,500 barrels, whereas on July 1, 164,590,942 barrels were in storage—a reduction of

* Address delivered by the president of the Standard Oil Company (N. J.) at the War Convention of American Business held under the auspices of the Chamber of Commerce of the United States of America, at Atlantic City, September 19, 1917.

† Chairman, Committee on Petroleum, Advisory Commission of the Council of National Defense.

Everybody who is anybody in the truck industry reads the CCJ

on German trenches. 10. New French tank just back from a raid, being hid under the trees.

9,779,558 barrels. This reduction is, however, largely in California stocks, in which state the situation is serious.

It will thus appear that with the stocks above ground and given the present rate of production and consumption, the supply is sufficient to insure our having enough oil for at least the next five years—provided the production is fairly maintained. So while the occasion is not one for alarm, it is one for taking intelligent measures toward adequate production of what we need. Such is the situation confronting the Petroleum Committee appointed by the Council of National Defense, to co-operate with the Government in meeting its oil requirements.

This committee, which is composed of men active in the production and refining of petroleum, has addressed itself wholeheartedly and unselfishly toward the work committed to it. The duties laid upon this committee may be briefly summarized as follows:

Petroleum Committee's Duties

1. To secure the necessary and adequate fuel oil and gasoline supplies for the fleets of the United States Navy, both at home and abroad, including the Coast Patrol Services; also the necessary gasoline supply for the transport and motor car and aeroplane services for our armies, operating abroad and at home, and for those now in the process of formation.

2. To secure the necessary fuel oil and gasoline supplies for the allied fleet of the British, French and Italian Navies, and the gasoline supplies for the aeroplane and transport service of the allied British, French and Italian armies, working directly with the War and Navy Departments of the allies through the British, French and Italian Missions.

3. To secure and arrange for the supplies of petroleum products (fuel, oil, gasoline and kerosene) necessary to the industries engaged in the production of munitions, both at home and abroad, and to cooperate with the various foreign agencies and government departments in connection therewith.

4. To co-ordinate the manufacture and distribution of petroleum products through the co-operation of the refiners of petroleum in the United States and, because of the present serious excess of consumption of oil over production, to endeavor to stimulate producers of crude oil to increase production, to the end that all needs shall be fully met.

The duties of the committee thus briefly outlined are of vital importance to the successful prosecution of the war.

It would not be appropriate on this occasion for me to go into details with reference to the methods pursued by this committee or exactly what it has done. Our duty has been, in a word, to find out what was wanted, and to furnish the supplies at the time and place they were needed. We have recognized that the Government requirements should have absolute precedence, and that no consideration of cost, convenience or selfish interest should interfere with our giving to the Government everything it asked of us. That has been our policy from the beginning—a policy carried out in good faith, and, I believe, to the satisfaction of the Government. The methods of carrying out that policy are largely matters of detail, and would not be of special interest, even if they were not so very confidential. Suffice it to say, that the plan has been to distribute the burden of taking care of these needs of the Government equitably among all producers. The question of price has not yet been determined by the Government. We are all interested in the price, of course, but we have confidence in the fairness and broad-mindedness with which this question will be met by the Government, and our acts have been in accordance with our faith.

Refinery Capacity is Adequate

The supreme problem which has confronted our committee in its efforts to serve the Government has been the problem of supply. The oil industry is distinguished from the coal and many other industries in that the problem of supply does not depend upon the present facilities for manufacturing or transporting. Figures compiled a year ago showed that there were 302 refineries in this country, with a daily capacity of 1,043,245 barrels of crude. The refining capacity of the country was increased by 50 per cent. in 1915 and 1916, and at least fifty new refineries were projected at the time the figures above named were compiled. The oil refining capacity of the country is indeed greater than the present demand.

The situation in a word is this: The country is producing oil at the present time at a rate of about 312,000,000 barrels annually; it is consuming it at the rate of over 330,000,000 barrels; and the refining capacity is upwards of 350,000,000 barrels. The pipe line and other transportation facilities now existing and in process of construction are reasonably ample to take care of the situation.

The refiners not only have increased their capacity to take care, by existing processes of crude production to supply existing demand, but they have employed the most expert talent in efforts to extract from crude petroleum gasoline and other products which are most in demand. Had it not been for the introduction of the "cracking process," invented by Dr. Wm. M. Burton, of the Standard Oil Company of Indiana, and other similar processes, the supply of gasoline would long ago have fallen far short of the actual requirements.

Gasoline Production From Gas

Great progress has also been made under pressure of necessity and enterprise, in producing gasoline from the casing-head gas and natural gas. This year approximately 2,500,000 barrels of gasoline will probably be obtained from this source, with more, probably, next year.

But when all has been accounted for, the fact remains that this country will next year require at least 55,000,000 barrels of gasoline, and that amount simply cannot be obtained from the quantity of crude petroleum now being produced.

The fundamental and vital problem confronting the petroleum industry today, is to increase the production of crude oil.

The conditions surrounding the production of crude are wholly different from those involved in the making of the refined product. By reason of the great amount of capital required to refine, transport and market oil, the number of those engaged in this part of the business is relatively small—not more than a few hundred. The number of those engaged in producing crude oil, however, is more than fifteen thousand. Many of the operations are very small, but each in its way contributes to the vastly important total.

The production of crude petroleum involves many unique features—different from all other mining operations. When one discovers a copper, iron, lead, silver, or coal mine, he can, with expert assistance, tell pretty definitely the minimum quantity of mineral available. The question of supply then becomes merely one of obtaining sufficient labor to work the mines.

The production of petroleum is wholly different. The process of drilling wells, often many hundreds of feet into the earth, requires many weeks, frequently months. The prospector never knows whether or not his enterprise will result in failure. Likewise, even after he strikes oil, he can never tell how long the supply will last. The great Cushing pool, discovered in 1914, produced hundreds of thousands of barrels of crude oil in a month, and the supply seemed inexhaustible. It played havoc with the whole oil price structure, and worked a veritable revolution for the time being in the industry. Then within a period of about 90 days the production fell off two-thirds, *i. e.*, from about 320,000 barrels daily to 112,000 barrels and today is about 70,000 barrels per day. Yet the discovery of this Cushing pool resulted from the extraordinary high prices paid, causing a large number of prospectors to drill wells. We know that there is plenty of oil in the earth, and it only takes a sufficient amount of effort and money to find it.

Oil Wells Recently Disappointing

For the first six months of this year, the producer of crude petroleum obtained discouraging results. Gushers have been less and less frequent, and dry wells more and more numerous. The price of crude oil has, meanwhile, rapidly gone up. Oklahoma crudes advanced from 40 cents a barrel in 1915—the hey-day of the Cushing pool—to $1.70 in January of this year, and remained at that figure for nearly seven months, advancing to $2.00 last month.

In spite of these greatly increased prices for crude oil, however, the number of new wells drilled has been decreasing, and notwithstanding the alluring prices for crude oil, the new production so far this year has been less than for the corresponding period of last year, and as I have already stated, the amount of all petroleum produced was considerably less than the amount consumed.

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The reduction in the amount of new work undertaken by producers may be explained on several grounds; first, the price of steel necessary to build storage tanks or for casing and tubing and drilling materials has become almost prohibitive, or where not prohibitive, the materials have been in many cases unobtainable by reason of the demand upon steel and iron mills for other products necessary for the prosecution of the war; second, the price of labor in the oil fields has greatly increased.

It is but natural that as a consequence of these great costs and of the reduced margin of profit to the producer through the discouraging returns from the wells themselves, the effort, energy and enterprise devoted to the production and prospecting for crude oil has seriously declined.

Here, then, are the broad outlines of our problem:

What should be borne in mind is that petroleum products, and particularly gasoline, while vitally essential to the uses of war, also have other uses intimately related to the comfort and satisfaction of our daily lives. It can be said easily that we could get along without the automobile. The same could be said of the telephone. But we know that without these instruments of civilization, the horizon of our life would be greatly reduced, and much of the efficiency and happiness of our civilization would be curtailed. The automobile has come to be not a mere article of luxury to the rich man, it has come to be a necessity to the merchant and the manufacturer in the cities, to the farmer on the plains and to the miner in the mountains. The automobile industry has become one of our great national assets, contributing enormously to the progress of civilization itself.

Gasoline Use Curtailed Abroad

It is true that some countries, notably England and France, have had to very greatly curtail the private use of gasoline. I understand that in England for instance, whereas before the war 75 per cent. of gasoline was consumed for private uses, at the present time private consumption has practically ceased, the supply being used by the Government in the direct conduct of the war.

But the reason for that is not so much the small amount of gasoline available, but the scarcity of the tonnage necessary to ship it in. Neither England nor France has any oil supply of its own. We, in this country, have the great oil reservoirs of the world. And the measures which other countries must take, because of the difficulty of getting supplies, need not necessarily be adopted in the United States itself.

It would be a great misfortune if any policy would be adopted, or any procedure taken, not absolutely necessary for the successful conduct of the war, which would hamper or handicap in any way the growth and value of the automobile industry as a manufacturing enterprise, or the successful and efficient use of the automobiles already in the possession of the public. Our national policy therefore should be directed toward preserving as nearly as we can all that we have, and taking care of the needs that are upon us.

It is true that immense economy in the use of gasoline could be effected by present owners of automobiles. There is no reason why everybody should not continue to use motor cars in their business, in movement from farm to village, or even in their pleasures. There is, however, an immense amount of utterly unnecessary use of the automobile which could be curtailed. Likewise, considerable saving could be brought about by more intelligent handling of the automobile engines themselves. The mere matter of letting engines run while cars stand still is a little thing in itself, but in the aggregate it results in an immense waste in gasoline.

The automobile producers of the country also have a great duty to the public to perform, not only in manufacturing the best possible car, but in instructing the users of cars on how to obtain the highest results from their gasoline consumption. Furthermore, there is still a great range of possibility in the invention and improvement of automobile engines in effecting more economical consumption of gasoline.

More Crude Oil is Imperative

But the great thing to be done, the absolutely necessary thing, is to induce producers of crude oil to make greater and greater effort toward obtaining a large product. The price should be sufficiently attractive to induce more and more people to drill wells, thus insuring a steady supply, and offering always a great pool which will make the whole situation suddenly easy.

We must bear in mind the fundamental difference between the nature of the problem of stimulating the production of crude oil and that of increasing the output of any other industry which is under the stress of supporting the Government in this war. In the oil business the problem is not that of speeding up the production of existing wells; their output is determined by natural conditions and can be affected to a very slight extent by man's efforts.

The oil situation is unique because increased production can only be secured through drilling new wells. New enterprises must be undertaken and new capital enlisted. This is impossible in the face of higher costs and a larger percentage of failures because of dry wells unless the profits to the producer of crude petroleum remain attractive.

I do not propose any plan whereby there can be a chance of a runaway market price, either for crude oil or for the refined product. But an exceptionally large percentage of refined petroleum products is consumed by those wanting it for use in automobiles and not necessarily to keep themselves alive, as they need coal or food, but because such is desirable in the rounding out of one's life and in the promotion of one's business. The law of supply and demand, with reference to this great field, involving the use of the automobile in our daily lives, should therefore be given reasonable opportunity to operate. Certainly, every possible inducement should be held out which it is necessary to hold out to bring forth a greatly increased quantity of crude oil production.

To conclude, let me say that there is not the slightest danger of there being a deficiency either of crude or refined products necessary for the uses of our Government, or for the use of the Allies, in the conduct of this war. America is producing and can produce all that will be needed for these purposes, and I suggest the following policies as ones which should be adopted with reference to the subject as a whole, and which may also apply in other industries.

1. Our Government should receive the first call upon all petroleum produced, either for itself or as it may designate for the use of our Allies in their conduct of this war.

2. The petroleum industry is not, so far as prices go, on a war basis. I mean by that statement to say that the prices are reasonable and fair and no undue advantage has been taken because of either the extraordinary demands due to war conditions or increased costs or shortage of crude. Prices have not materially advanced during the present year in spite of the increasing costs due to increases in wages and high costs of material, and I believe the trade generally will maintain that position, making only such advances in the prices of their products as may be necessary to meet increase in costs of manufacture or material or crude oil.

3. Should, however, there develop a tendency towards the establishment of a runaway price, for instance, for gasoline, it would invite Government regulation of prices.

4. Within these limitations, the law of supply and demand should be permitted to operate freely. There should be a campaign of education of automobile users, showing them how they can obtain the utmost usefulness from their cars with a minimum consumption of gasoline; and above all else, every possible inducement, patriotic, educational and financial, should be given to the crude oil producers of the country to bring forth from the earth—where plenty of oil is still concealed—all the crude petroleum which may be necessary not only for the conduct of the war, but enough to insure the progress and comfort of our daily lives.

THE TOPPING MOTOR TRUCK & MACHINERY CO., Oliver Bldg., Pittsburgh, Pa., announces the recent appointment of E. F. Defibaugh as chief of the Service Department. This firm is distributor of Gramm-Bernstein and Day-Elder Motor Trucks in Western Pennsylvania and West Virginia, in addition to which it is specializing in auxiliary equipment to motor trucks, such as trailers, material handling machinery, loaders, etc.

TITANIUM ALLOY MFG. CO., Niagara Falls, N. Y., owing to the constantly increasing demand for Superior bronze and brass castings, has enlarged its bronze department and made a distinct unit of it under the name of the Tutanium Bronze Co., Inc.

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Co-operation Between Society of Automotive Engineers and the Government

MUCH has been printed, from time to time, regarding the important functions performed by engineers in the conduct of modern warfare. Perhaps no fields of engineering are more important than those represented in the Society of Automotive Engineers, and this Society has been and is performing splendid service for the Federal Government.

Transportation in all its phases is of prime importance to every army, and in several important branches of transport service the Society is rendering invaluable assistance. This includes work having to do with the design and construction of motor trucks, tractors, airplanes, tanks, ambulances, motorcycles and other automotive apparatus propelled by internal combustion engines.

For more than a year the Society, through its Truck Standards Division and many of its engineering members, has been co-operating with the Quartermaster Department in the formulation of specifications and designs for military trucks. When the importance and possibilities of this work were fully realized it was extended to include even the smallest detail and was taken over by the Government, members of the Society still co-operating effectively. No less than 50 S. A. E. members are now located in Washington, giving active assistance and advice to the Government in the design of the military trucks. What this means can be appreciated only by those who understand what a mass of detail work is involved in keeping fleets of trucks in operation and supplying new parts as required.

The Aircraft Production Board

In connection with the aircraft program the Society is co-operating in an equally effective manner. The chairman of the Aircraft Production Board is a past president of the Society, and two of its four other civilian members are also prominent members of the Society.

The Chief of the Aircraft Engineering Division of the Signal Corps, the late lamented Henry Souther, was also a past president of the Society, and in each of the sub-divisions of this Section the Society is represented by at least one member. The sections included are Airplane, Inspection, Power Plant, Transport, Design and Experimentation. In co-operation with the Aircraft Engineering Division of the Signal Corps, and with the Aircraft Production Board are a very large number of S. A. E. members, some holding positions of authority and others in a subordinate capacity. Still others are entering as rapidly as the need for additional men is made known.

Outside the organization of the Government, but in very close co-operation with it, the Aeronautic Division of the Society of Automotive Engineers Standards Committee is doing excellent work. It has already, after careful research, recommended numerous standards which are in turn being adopted by the Army and Navy.

The standard U. S. A. aviation engine has been designed by two well-known engineers, both of whom are prominent members of the Society, while associated with them in this work are several other S.A.E. members, who will cooperate in the production and testing of these engines.

Motorization of the Artillery

In the Ordnance Department the need for motorization of artillery and the handling of ammunition by means of motor-driven vehicles is fully appreciated. In the development of apparatus for this purpose the Society is represented by its president, a past vice-president and several other members. Rapid strides are being made toward what will doubtless be the most completely motorized artillery equipment of any of the Allied powers. This motorization involves not only the use of numerous trucks, most of which will be of the four-wheel-drive type, but also the use of numerous tractors. Closely associated with this work are the design and construction of any apparatus like so-called tanks, that may be developed. Another past president of the Society is commissioned to work upon the development of these special engines of war.

But the activities of an engineering organization are by no means confined to the destructive side of warfare. Engineers must, for example, be charged with the design, operation and upkeep of motor-driven ambulance equipment. Another member of the Society has recently been commissioned to take charge of this important work. There will doubtless shortly be associated with him in this work other S. A. E. members who have specific knowledge of requirements in this field.

In connection with the Navy Department the Society is not so completely represented, since it has only recently taken up matters pertaining to the standardization of marine engines and their accessories. The S. A. E. is, however, represented in marine warfare, insofar as this has to do with the power plant of the boats of the "submarine chaser" type and with the production of seaplanes.

The relation of the tractor to the food problem has been frequently discussed, and is a subject in which the Society is deeply interested, and in connection with which it is actively co-operating not only with the United States Government (through the Department of Agriculture) but through other channels with the British and the French Governments. It is realized, of course, that the food problem is second to none in importance, and the attention being given this matter from the standpoint of the tractor engineer, is in keeping with the other activities of the Society.

Standardization in connection with motorcycles (August issue, page 19), is another feature in which the Society is doing active work, and in which the Government is taking an active interest.

It is obvious that the Society of Automotive Engineers is living up to its reputation for efficient co-operation, and that there is very good ground for its maintaining a branch office in Washington. This Washington Office is not only forwarding the co-operation with the Government outlined above, but is keeping in close touch with the various branches of the War and Navy Departments, with the purpose of helping these Departments secure the assistance of capable men for the conduct of engineering work. In so doing, it is also serving its membership by helping to secure commissions for those of its members who are desirous and well qualified to enter the Government service.

THE AUTOMOTIVE ELECTRIC ASSOCIATION held its summer meeting at Fisher's Island, N. Y., on September 6th, 7th and 8th. It was attended by every member company and some companies had as many as five representatives. The following papers were presented: "Why We Should Standardize Business Forms and Practices," by C. O. Miniger; Patents, by Victor S. Beam; Advertising, by J. C. McQuiston. A resolution was adopted to co-operate with the Government to the fullest extent in adopting a uniform standard electric equipment for its class A and B military trucks.

A Group of Trucks "Doing Their Bit" in the Service of the Curtiss Aeroplane Company

In Buffalo, thousands of men have been employed in newly built factories, to enable the Curtiss Aeroplane Company to help the United States Government win the war through the air. The work rushes on at breakneck speed, day and night. To facilitate the getting of materials as needed, the above fleet of Atterbury trucks have been "drafted" into service.

"A little knowledge is a dangerous thing." The CCJ keeps you fully posted

Census of Automobiles, Bodies and Parts Made in 1914

THE figures covering the operations of the automobile industry are derived from a consolidation of the reports made (1) by establishments manufacturing complete automobiles as their product of chief value and (2) by those engaged chiefly in the production of automobile bodies and parts. (The term "bodies and parts," as here used, signifies all automobile parts other than tires, engines, lamps, springs and electric motors and starting and lighting systems.)

The table summarizes the more important figures relative to the combined industry and to each of the branches for 1914.

	Total. [1]	Automobiles.	Automobiles bodies and parts. [2]
Number of establishments	1,271	300	971
Persons engaged	145,951	91,997	53,954
Proprietors and firm members	760	60	700
Salaried employees	18,099	12,630	5,469
Wage earners (average number)	127,092	79,307	47,785
Primary horsepower	173,684	104,983	68,701
Capital	$407,729,915	$312,875,884	$94,854,031
Salaries and wages	$139,452,553	$84,900,520	$54,552,033
Salaries	$37,525,679	$17,966,161	$19,559,518
Wages	$101,926,874	$66,934,359	$34,992,515
Paid for contract work	$3,954,924	$3,768,809	$186,115
Rent and taxes (including internal revenue)	$5,152,314	$3,331,311	$1,821,003
Cost of materials	$356,207,930	$292,597,565	$63,610,365
Value of products	$632,831,474 [2]	$503,230,137	$129,601,337
Value added by manufacture (value of products less cost of materials)	$276,623,544	$210,632,572	$65,990,972
Automobiles made:			
Number	569,054	568,781	273
Value	$458,957,843	$458,760,916	$196,927

[1] In addition, 3985 automobiles, valued at $6,099,631, and bodies and parts, to the value of $11,045,205, were manufactured by establishments engaged primarily in other industries.

[2] Does not include tires, engines, lamps, springs, and electric motors and starting and lighting systems.

Reports were received from 1271 establishments engaged in the manufacture of automobiles, including bodies and parts, in 1914. Of this number, only 300 made complete automobiles as their product of chief value; but these establishments employed about two-thirds of the average number of wage earners engaged in the industry and reported nearly five-sixths of the total value of products.

The value of products shown for the combined industry includes a large amount of duplication, due to the fact that most of the bodies and parts made by establishments engaged primarily in the manufacture of these products are utilized as materials by other establishments.

On the other hand, the figures for value of product do not cover the output of automobiles, bodies and parts and accessories made by establishments classified under other industries. Establishments of this character reported, for 1914, the manufacture of 3985 complete automobiles, valued at $6,099,631; bodies and parts, valued at $11,045,205; rubber tires, valued at $139,515,716; engines, to the value of $11,622,961; lamps, to the value of $5,812,439; springs, to the value of $6,527,854, and electric motors and starting and lighting systems, valued at $7,284,715.

The net value of products of the automobile industry as a whole is probably most nearly represented by the total value of the complete machines manufactured, $458,957,843. This figure, however, excludes the value of bodies, parts and accessories made for sale as such to garages and dealers.

Of the 569,054 automobiles turned out by the establishments in this industry in 1914, all but 273 were made in those reporting complete automobiles as their product of chief value. The total number of machines manufactured in that year, including those reported as subsidiary products by other industries, was 573,039, and their total value amounted to $465,057,474.

Bureau of Mines Bulletin

The Bureau of Mines, Department of the Interior, Washington, D. C., has issued Bulletin 120 on "Extraction of Gasoline from Natural Gas by Absorption Methods," by Geo. A. Burrell, P. M. Biddison and G. G. Oberfell. This Bulletin is for free distribution.

The extraction of gasoline from natural gas by compression and condensation has been an important and rapidly growing industry in recent years. In 1915 about 65,000,000 gallons were produced by such methods, while in 1916 the estimated production was 100,000,000 gallons. This gasoline is of doubled importance in that it can be blended with naphthas otherwise unsatisfactory for use in the automobile, and made into an acceptable motor spirit.

The absorption process is quite different from the older compression process and heretofore has not been described in literature. It is a method only recently commercially applied to natural gas yielding the same quality of gasoline and capable of being applied under conditions where the older process could not be employed profitably. By it the gasoline in natural gas, though extremely lean, can be absorbed in oil from which it is separated by distillation. Natural gases yielding less than one pint of gasoline from each thousand cubic feet of the gas have been treated with commercial success, where formerly this gasoline had gone to waste and had constituted a source of much trouble and expense in the pipe lines.

Movable Army Bakery Truck

A portable bread making machine is being demonstrated at the Presidio at San Francisco, and if the War Department approves, it is possible that the American soldiers may have fresh bread at any and all times. At present there is no way of keeping the soldiers supplied with fresh bread when at the front, but with such a machine as James Garvey has designed, mounted on a powerful Selden chassis, this difficulty will be relieved. It will completely make a loaf of bread, performing all functions customary to hand work. It mixes the dough, molds any shape desired and divides it into loaves of predetermined weight. Whatever adjustments are necessary to change weights and molds are made by a hand wheel control.

The bread ingredients are put into an automatic mixer and at the proper time are discharged into troughs and allowed to raise. When properly aged the dough is fed into an automatic divider and molder and is kneaded as it passes through by chain-operated belt conveyers.

The capacity of the outfit is, minimum, 3000, and maximum, 6000 loaves of any size, weight and shape desired in one hour. With five men employed it will do the same work that 112 men are now required to perform the same functions in the army. In addition, the dough is machined in a sanitary manner, the finished loaves being discharged into baking pans ready for oven.

FULTON MOTOR TRUCK CO., Farmingdale, L. I., announces that it will specialize upon one model—the 1½-ton Fulton—during the coming year. This is the type that this concern has produced since the starting of the business over a year ago. The output of the factory is to be greatly increased and according to schedule, 2500 machines are to be built, as compared with 1000 during the last 12 months.

A TANK CAR HAS MATERIALLY assisted the recruiting officers in the Chicago district during the last few weeks. The tank is of a specially constructed type and is very formidable looking with heavy guns mounted in wartime fashion, an American flag floating from the top and a recruiting banner on the rear. It is equipped with a platform from which the recruiting officers make addresses. The tank is built over a Dodge chassis, the entire outfit having been placed at the disposal of the Government by the Dashiell Motor Co., of Chicago. The same tank will appear in many of the leading cities of the country.

All phases of the truck industry covered best in the CCJ

Government Automotive News

Reorganization of Automotive Committee. Liberty Motor

THE Automotive Products Committee of the War Industries Board has succeeded the Co-operative Committee on Automotive Transport of the Council of National Defense. This is a result of the reorganization of the latter body following the retirement from it of K. W. Zimmerschied, who is now giving all his attention to the international standardization committee on airplanes. H. L. Horning has succeeded Mr. Zimmerschied as chairman and will be in charge of the production of tractors and trucks.

Frank W. Russell will represent the Aircraft Manufacturers' Association as far as production is concerned, on this new committee; C. W. Stiger, the Motor and Accessory Manufacturers' Association; Col. Chauncey B. Baker, of the Army, the quartermaster corps; Coker F. Clarkson, the Society of Automotive Engineers; T. W. Henderson, the motorcycle association; Henry R. Sutphen, the motor boat associations, and Hugh Frayne, labor.

Reports are that the production end of the standardized U. S. A. engine, or "Liberty Motor," due to far-sightedness in preparing for expeditious work along this line, is in excellent shape. Since announcement was made of the approval by the War Department of the Liberty Motor, as developed by automotive engineers for use in different types of planes for actual service in war, interesting details touching the construction of the engine, all looking to the use of the same cylinders, valves, valve action, camshaft design and the same camshaft drive in four-, six-, eight and twelve-cylinder engines have been discussed with keen interest in the results accomplished.

Making Parts Interchangeable

Interchangeability of parts in the field is of course as advantageous in aviation as in motor trucking. For instance, when an individual cylinder can be used on any one of the four engine models without change; the pistons in one may be transferred to another; the connecting-rods made for the four can be transferred to the six, or those used in the eight can likewise be used in the twelve. The saving of time and lives and the turn of a battle may be the good results growing out of such interchangeability.

The great advantage not only of having in the field, but of shipping, one supply of spare parts for the four aviation models is apparent. Such parts as crankcases, crankshafts, etc., naturally cannot be interchanged between engines of different cylinder numbers.

Now that American genius has made it possible to convert a four into a six, or an eight-cylinder into a twelve, with the addition of only few parts, the next task will be the international standardization of aviation more, and as far as practicable this is to be done.

This problem may be simplified by the fact that the Liberty Motor represents a composite of ideas found in aviation motors of the Allied countries, being therefore largely an assembling of the best in the aviation engines of the Allied nations. However, to the American engineers can be given the credit for making practicable the interchange of valves, pistons, cylinders, etc. Two engineers, Hall and Vincent, who more than others in this country are entitled to credit for evolving the finished motor product, were furnished blue prints of captured German machines, as well as of the best the entente nations had to offer.

The manufacture of the new motor will, necessarily, have to be surrounded with secrecy, and just where it will be turned out, whether in one factory or in a number of them, will be kept from the public. Prompt action and prompt results, considering the size of the task, may be expected. That the smaller airplanes will be manufactured here, instead of the big battle planes, carrying several passengers and two or three big guns, is considered pretty certain for one reason if for no other, this being that the American Government would be faced with an almost hopeless task in providing ship space in which to transport the big machines to Europe. The problem of tonnage already is one which is giving the United States and its Allies serious concern.

While the new motor is being built it is expected that experiments will go on to the end that improvements may be brought about. The wonderful efficiency of the aviation motors of the entente nations today is said to be a result of the fact that experiments have never stopped. While the best available is put into the field, engineers continue to try to find ways in which to improve it. Therefore valuable improvements to the American product are considered not improbable.

Also the manufacture of other models of airplanes, it is suggested, both for American and European governments, will continue without serious interruption, despite the strain involved in the turning out of the great numbers of the completed planes with the Liberty Motor installed. The assembling of materials for parts is also being looked after in the same systematic manner as the assembling of materials for the engine.

Motor Cars in Red Cross Work

Great Need of More Ambulances on Russian Front

By LEE L. ROBINSON

THE modern motor vehicle as an agency of mercy is one of the most interesting developments of the present war. Naturally the use of the motor machine in this connection suggests the extent to which that great humanitarian instrument, the Red Cross, is depending upon it to carry on its work. Not only on the French but on the Russian fronts, where, according to advices received in Washington, urgent need exists for ambulance transports with drivers and machinists, the ambulances sent from this country are being principally concentrated.

The American Red Cross is now shipping 125 motor ambulances and automobiles to the Red Cross Commission in Russia. Ambulances, it is stated, are needed with the Russian army almost more than any other form of relief. As illustrating this fact, there are now on the Eastern front in Russia only 6,000 vehicles for transporting the wounded, while on the French front, only a third as long, there are 75,000 ambulances. The motor vehicles, both automobiles and ambulances, now being shipped to Russia will equip one Russian army corps with five complete ambulance sections.

Each section will include fifteen motor ambulances, one auto bus for transporting the slightly wounded, one kitchen trailer, and one dressing station car. In addition each section will have two touring cars for the use of officers; three light delivery trucks, one repair car, carrying the necessary tools and extra parts, and one extra car for gasoline. This equipment for the ambulance sections does not, of course, take into consideration the trucks and other motor transportation being actually used on the field of battle.

As far as Russia is concerned it will be depended upon by the Red Cross to furnish its own drivers for these ambulance sections, operating under Red Cross direction, and if it is found necessary later to provide the personnel for these sections in America the latter will be recruited from volunteers in this country.

Despite the fairly good equipment on the French front, a unit of motor ambulances and trucks has been sent to Major Grayson M. P. Murphy, in charge of Red Cross work in France, to supplement that already in service. In addition to ten Pierce-Arrow dumping trucks, used to handle coal, fifteen Pierce-Arrow trucks and fifteen of another make of 2 to 5-ton capacity have been sent. The service in France, however, where the supply of experienced operators of motor machines has almost been exhausted, has sent a request for as many experienced motor truck drivers, helpers and expert mechanics as can be furnished. The mechanical squads being sent to France include master carpenters, body builders, painters, machinists and electricians, two each to the squad. The trucks for which drivers are especially needed at this time in

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France are of 2-ton capacity and will be used in the rapid transit of Red Cross supplies from sea ports to their destination, a service made necessary by the congested conditions of the railroads in France.

The Red Cross has been urging volunteers beyond military age to offer their services to make up mechanical squads, especially those in position to work without compensation. Red Cross officers here are expressing the hope that employers of motor drivers and other expert help required may be found who will contribute the services of such men, paying their salaries while in Red Cross service. In such cases the Red Cross will pay the transportation and living expenses of the men while abroad and in addition will give them intensive mechanical training, some drilling and, if possible, some preliminary instruction in the French language.

Even before the entry of the United States into the war this country contributed hundreds of volunteer ambulance drivers and mechanics, many schools and colleges sending units at local expense, and great numbers of ambulances, trucks and automobiles also were contributed. This work has kept up since the United States entered the war and it is expected will continue to keep up in a most praiseworthy manner. The Ford Motor Co., of Detroit, recently made a gift of $500,000 to the American Red Cross. This gift is in the form of a credit on the Ford factories for automobiles, ambulances, parts, etc., to the amount in question, and as the Red Cross may designate.

Interest is being shown in Red Cross and War Department circles at Washington in experiments on new types of ambulance bodies in different sections, the New York County Chapter of the American Red Cross now being engaged in such an experiment to which the New York Transportation Co., operating motor bus lines on Fifth Avenue and other streets, has contributed the services of its chief engineer for this particular work. This same Chapter has already furnished kitchen trailers in large numbers to ambulance companies in training in this country.

In an effort to solve tremendous transportation problems which have arisen in France in connection with the furnishing of tangible assistance to the armies of the United States there, as well as assisting the stricken civilian population of Europe, the American Red Cross is equipping a fleet of motor transports for use in France. A considerable part of this fleet has already been forwarded, each unit being completely equipped and manned, ready for immediate service, with experienced drivers, mechanics and other craftsmen in the personnel. This work is being carried out under the personal supervision of an experienced railroad executive and promises to demonstrate that the motor truck may be important in relieving distress caused by wounds, sickness, hunger and loss of home and home comforts.

When this war is over and a complete inventory is possible of the equipment in motor vehicles of various kinds, with the personnel necessary to handle them, the world doubtless will be surprised at the extent to which the modern motor machine has contributed to the success of the work of the world's Red Cross and similar organizations.

Progress on the Government's Standard Military Truck

DAY after day as war preparations continue, more and more emphasis is laid upon the extent to which the United States is depending upon the modern motor vehicle. Results of the activities of the Government within the last four months in developing the motor truck for military purposes are amazing and a testimonial to the engineering skill, initiative, dependability and patriotism of the American engineer and motor car manufacturer.

Profiting by the lessons of the Mexican expedition, the Quartermaster Corps of the Army, acting with the Secretary of War and Chief of Staff, lost no time when the German situation developed in getting in intimate touch with the motor car industry. The manufacturers and their engineers were instantly at the command of the Government.

Orders for trucks were issued, running into the thousands; individual manufacturers were asked to seek as far as possible to standardize parts of their engines to the end that the Government would be able in France to duplicate and make repairs expeditiously in times of extreme need; the assembling of parts, as well as the training of workmen for special duties, to be used in an emergency, was urged; conferences were held in Washington in which engineers and manufacturers participated in suggesting short cuts to a complete motor equipped army, and, last but far from least, the standard military truck was designed and is now ready for manufacture.

Within the first six months of 1918 it is expected that the first 15,000 standard military trucks will have been delivered to the Government. These trucks will be built in two models, Class A, with a normal carrying capacity, under the arbitrary official ruling, of 1½ tons, and an actual commercial capacity of three tons, and Class B, with a normal capacity of three tons and an actual capacity of five tons. The engine used in the two will be the same in design except for slight differences in cylinder bore, pistons, piston parts and riggings.

Interchangeability of parts between the two will be possible to a large degree. Both trucks will have a two-wheel drive, with a speed requirement of fourteen miles per hour for the Class A trucks and twelve miles for the Class B. The first order for these trucks will call for 10,000 of Class B and 5,000 of Class A.

Two trucks each are to be built by the Gramm-Bernstein and the Selden companies, and these are expected to be ready at the earliest possible moment. A sample chassis, representing the efforts of approximately two-score truck specialists, will be given final tests before November 1. Secretary of War Baker, in a congratulatory statement discussing the "designing of the new standard military truck which must meet the field transportation problems of modern warfare," said that within ten days after the design of the standard truck was completed early in September, "detailed drawings were made and sample parts ordered. Ordinarily it requires several months to perfect and turn out such parts, but various manufacturers patriotically agreed to put ahead the Government's work.

The crankshaft die was sunk in seven days and the crankcase pattern and first casting were made five days after receipt of the drawings. It is now believed that the new standard motor truck will fully meet the requirements of the army in the field. Rapidity of manufacture, stability and standardization are the outstanding promises of the new truck."

Deliveries of the finally approved and completed truck are expected to begin early in January. If they do, this modern day achievement will have become a reality within less than four months from the time the first step was taken by the War Department to that end. It will then illustrate what is possible in America when a crisis exists. Naturally both manufacturers and engineers had to contribute generously of trade secrets in order to make this possible, just as was done in the development of the aviation engine.

Because of the rather spectacular character attaching to the modern airplane, the completion of the "Liberty Motor" was attended by rather more dramatic surroundings than the production of the design for the standard military truck. Tests of the Liberty Motor high in the air around Pike's Peak and elsewhere gave a romantic tinge to this problem, but, again quoting Secretary Baker, "in the conduct of the war it is essential that we shall have large numbers of airplanes; it is also essential that transportation on land shall be highly developed. The designing of an acceptable truck is a distinct achievement."

RAINIER MOTOR CORP., Fulton, N. Y., has made several changes in its New York offices owing to the resignation of Jack A. Rainier, who has received a commission as 1st Lieutenant in the Ordnance Corps of the U. S. Army. P. N. Lineberger, vice-president and sales manager, has removed his office from Flushing to the New York office at Broadway and 51st St., where the wholesale and retail sales de- in charge of both branches and E. H. Burtnett, formerly head salesman, will be assistant manager.

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Use of Motor Trucks in Camp Building

Made Possible the Rapid Erection of the National Army Cantonments

By SAMUEL SAYWARD

THE impossible has been accomplished in the building of the huge army cantonments, but the impossible was accomplished some years ago and we are just beginning to realize it. The perfection of automobiles and motor trucks made possible the completion of the army camps on schedule time."

This is the opinion of Fred T. Ley, of Springfield, Mass., the contractor who successfully completed one of the sixteen Government camps into which the big draft army of the nation has moved.

With sufficient men, each equipped with sufficient ability, the planning of the sixteen huge army camps, each a veritable city in itself, was soon accomplished. Engineers of every variety were assembled, timber was secured from the mills sawed into unit lengths and widths and when it reached the camp it was put through more saw mills and prepared to be put into position by the army of workmen. They could not waste time sawing boards. They simply drove nails and the army buildings resulted.

There were factories that turned out thousands of windows. Other factories turned out steel work, hardware, pipe for the water and heating systems. Factories turned out miles and miles of copper wire for lighting. Factories turned out every kind of a supply used. These factories were already built and their mass of work for the Government was accomplished by speeding up production.

Transforming Fields Into Camps

Then came the task of placing the soldier cities upon sites which, on June 1, were veritable wildernesses.

First it was necessary to have roads through the camp sites. These sites vary somewhat in size, but the average site occupies about twenty square miles. Usually there is only a single main roadway leading from the nearest city or town to the site selected. In a few cases a second roadway skirts the site at right angles to the main roadway. To have gathered together a sufficient number of horses and teams to haul materials for the roadways would have resulted in the existing roadways being so congested as to be impassible. Here came the first real job for the motor trucks. Carrying from two to five tons of road-building materials at a load and obeying the rules of the road, there was no congestion of the main highways. Not only was there no congestion, but the roadways were made to accommodate thousands of additional passenger cars operated by people desirous of witnessing the huge undertaking.

The great trucks, each operated by a single driver, saved thousands of dollars in labor cost. With their broad tires they rolled down the roadways as fast as a section was constructed. Into the lowlands they dumped their filling. Huge motor shovels, operated on the same plan as the steam shovels used in canal construction but by the single engine that also propelled the trucks, tore down the hills where the trucks awaited their great jawfuls of earth to transplant to the lowlands. Other hungry monsters dug the ditches into which the water and sewer pipe was hustled, to be followed by great motor plows that filled in and smoothed over the trenches.

Construction engineers conducted operations in various parts of the camp sites at the same time. To have walked the three to six miles, from one set of operations to another, would waste hours of time. High-powered roadsters carried the engineers from point to point more quickly than the engineer usually took to travel over an ordinary building operation. Horses were tried but had to be discarded except by the foreman, whose work was concentrated in one section.

Time Saved Transporting Workmen

There were no quarters for the army of workmen. The walk to and from the nearest transportation lines consumed hours, which, multiplied by the number of workmen, would mean thousands of hours a day. The fleet of motor trucks came to the rescue.

Food had to be brought from a distance for the workmen. It was the motor truck that hauled it. As the work progressed and quarters were built on the ground for the workmen, the trucks were transferred to other work. Then came the administration heads to direct the rapidly advancing city. Each traveled in an automobile. An office force of clerks and stenographers and telephone operators soon followed. The motor buses carried them to and from the cities or railroad centers and boarding houses tc the cantonments. The trucks were used to haul food for the horses that they are rapidly transplanting.

Everybody and everything that went into the construction of these huge army camps was more or less dependent on the automobile and motor truck. From the time that motor tractors plowed out the stumps and cut the underbrush of the wilderness until the last drafted man was brought into the camp for his military training, motor vehicles of some kind contributed to every success and every detail of the work.

To keep these trucks in condition very complete service stations were erected at each cantonment. These cost upward of $30,000 with their equipment, and were ready to repair, at a moment's notice, any part of the machines. When the day's work was done each machine was inspected by the chauffeur and any repairs of a minor nature were reported and immediately made, although the actual cost of maintenance of the trucks, pounding over the rough and partly constructed roads with their capacity loads on every trip, was almost infinitesimal. Each night, before sundown, the trucks were drawn up side by side in double lines, each truck an equal distance from its neighbor and the front wheels in as perfect a line as an army on dress parade.

It is wonderful to contemplate the fact that so many million feet of lumber, so many hundred miles of pipe, so many hundred miles of copper wire, so many thousand light bulbs, so many thousand articles of every nature were turned out and placed by so many thousand men, but the real romance of the mushroom cities which have sprung into being can only be told by the army of motor trucks and their operators who took part in every variety of work done on the camps and whose ability to successfully carry out the great task assigned them rests in the brains of the engineers who designed and perfected their manufacture.

WESTINGHOUSE ELECTRIC MFG. CO., Pittsburgh, Pa., has recently secured contracts for electric generators for the 1918 output of the Locomobile, Pierce-Arrow and Garford companies.

THE PRONOVOST TORSION SPRING WHEEL CO., Detroit, has offered to the Government, without profit, its spring wheel and its 4-wheel drive, which is applicable to all motor-driven cars or trucks.

THE FORD MOTOR CO., Detroit, has donated $500,000 to the American Red Cross in the form of a credit upon the Ford factories for automobiles, ambulances and parts as the Red Cross may designate.

THE DETROIT CITY COUNCIL is considering an ordinance regulating loads carried by motor trucks and trailers to prevent the destruction of pavements. Evidence has been produced showing that truck loads up to 15 tons are being operated on the streets, the Department of Public Works being the worst offender. Width of tires, speed of heavy vehicles and prevention of more than one trailer will be incorporated in the ordinance.

D. C. RHODES AND O. C. LEWIS, of the Automobile Club of Southern California, recently made a trip from Los Angeles to Salt Lake City in a Vim truck for the express purpose of marking the Lincoln Highway. These men travelled in all kinds of weather and over all kinds of road with a constant overload and reported an average of 20 miles an hour and nearly 20 miles per gallon of gasoline. They erected 100 posts and set up 250 signs for the direction of tourists, making the round trip without any delay or trouble of any kind.

Why is the CCJ the only truck paper a member of the Audit Bureau of Circulations? Here's food for thought

War Revenue Bill Taxes Trucks

The War Revenue Bill, as approved by the Conference Committee, and passed by the Senate and House, has become a law, having been signed by President Wilson on Wednesday, October 3rd. This three per cent. war tax is to be levied on all motor vehicles, including motor trucks, motor boats, and motorcycles. The tax is payable by manufacturers, producers and importers, and is interpreted to mean the tax on the price which the manufacturer receives. The manufacturer may deduct five per cent. of the amount paid for the tires from the amount to be paid on each vehicle, this to include the inner tubes on such vehicle.

On cars held by wholesalers at the time the bill became a law, there is a tax of one and one-half per cent., being one half of the three per cent. tax. This probably will not include second-hand cars. It is intended that the tax shall be against the purchaser of the vehicle, the manufacturer acting as the selling agent, and being responsible to the government for the amount levied. Members of the Committee suggest that the automobile manufacturers decide for themselves the manner in which to apply the tax—that is whether to include it in the list price or whether to list the car at its regular price, adding the war tax as an extra item. The war tax will probably be levied on cars that have been contracted but not delivered.

Cars or trucks sold to the United States Government will probably be exempt from the tax, but if not, the tax can be added and returned through the revenue office.

It is certain that the manufacturer will pass this tax on to the dealer, who in turn must either sell the car at an increased price or sell it at the usual price with the war tax added. Although the number of sales may diminish, the drop is not expected to be great, since this tax on a one thousand dollar car will be but thirty dollars.

The war tax on trucks seem unjustifiable, but the Conference Committee declares that the revenue is needed and taxing the trucks would greatly increase the revenue.

As the revenue bill stands, bicycles, carriages, wagons and other articles of this nature have been exempted, and the tax rate on other goods, not necessities, but is 2 per cent.

The provisions of the bill pertaining to motor cars are as follows:

Title VI—War Excise Taxes.

Section 600. That there shall be levied, assessed, collected and paid:

(a) Upon all automobiles, automobile trucks, automobile wagons, and motorcycles sold by the manufacturer, producer, or importer, a tax equivalent to three per cent. of the price for which so sold;

From the tax which otherwise would be imposed upon manufacturer, producer, or importer of automobiles, automobile trucks, automobile wagons, or motorcycles there shall be deducted an amount equivalent to five per cent. of the amount paid for the tires, including inner tubes on such vehicles by such manufacturer, producer, or importer;

That upon all articles enumerated in subdivisions above which on the day this act was passed are held and intended for sale by any person, corporation, partnership or association, other than a retailer who is not also a wholesaler or the manufacturer, producer, or importer thereof, there shall be levied, assessed, collected and paid a tax equivalent to one-half of the tax imposed by each such sub-division upon the scale of the articles therein enumerated. This tax shall be paid by the person, corporation, partnership or association so holding such articles.

The taxes imposed by this section shall be assessed, collected, and paid in the same manner as provided in Section 1002 in the case of additional taxes upon articles upon which the tax imposed by existing law has been paid.

Nothing in this section shall be construed to impose a tax upon articles sold and delivered prior to May 9th, 1917, where the title is reserved in the vendor as security for the payment of the purchase money.

Title X—Administrative Provisions.

Section 1007. That (a) if any person, corporation, partnership, or association has prior to May 9th, 1917, made a bona fide contract with a dealer for the sale, after the tax takes effect, of any article upon which a tax is imposed under Title III, IV, VI, (covering tax on automobiles) or IX, or under subdivision fourteen of Schedule A of Title VIII, or under this section, and (b) if such contract does not permit the adding of the whole of such tax to the amount to be paid under such contract, then the vendee shall, in lieu of the vendor, pay so much of such tax as is not so permitted to be added to the contract price.

The taxes payable by the vendee under this section shall be paid by the vendor at the time the sale is consummated, and collected, returned and paid to the United States by such vendor in the same manner as provided in Section 503.

The term "dealer" as used in this section includes a vendee who purchases any article with intent to use it in the manufacture or production of another article intended for sale.

* * *

Section 1002. That where additional taxes are imposed by this Act upon articles or commodities, upon which the tax imposed by existing law has been paid, the person, corporation, partnership or association required by this act to pay the tax shall, within thirty days after its passage, make return under oath in such form and under such regulations as the Commissioner of Internal Revenue with the approval of the Secretary of the Treasury shall prescribe. Payment of the tax shown to be due may be extended to a date not exceeding seven months from the passage of this Act, upon the filing of a bond for payment in such form and amount, and with such sureties as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, may prescribe.

GOODYEAR TIRE & RUBBER CO., Akron, O., announces that the August sales amounted to $12,500,000. This is the largest month's business in the history of the company. Goodyear business for the first 10 months of the fiscal year now stands at $89,000,000.

Military Value of Good Roads

A demonstration of the value to the nation of a system of military highways connecting the supply bases with the military cantonments was made October 11. Six 2-ton motor trucks laden with Government supplies for the supply depot of the post quartermaster at Ft. Oglethorpe, Ga., left the warehouse of the depot quartermaster at Atlanta for the 115-mile trip over the Dixie Highway. At the same time a test was made in transporting infantrymen. A specially constructed high-powered passenger truck, built according to specifications of Major-General Leonard Wood, took sixteen soldiers from Ft. McPherson to Ft. Oglethorpe, together with their guns, ammunition and full marching equipment.

Major R. B. Powers, U. S. Q. M. C., post quartermaster at Atlanta, assisted by Capt. A. T. Dalton, U. S. Q. M. C., post quartermaster at Ft. Oglethorpe, will prepare data as to the time required and the cost of making a similar shipment by rail. Official observers compiled data relative to the time required in loading, transporting and unloading the supplies, road conditions, and detailed costs of gasoline, oil, depreciation, etc., on the trip. The Dixie Highway Association, the Georgia State Automobile Association and the Chattanooga and Atlanta Automobile Clubs co-operated in obtaining the information desired.

The Secretary of War and Major-General Leonard Wood in letters to Judge M. M. Allison, president of the Dixie Highway Association, have called attention to the high patriotic service the citizens of the counties can perform in the construction of important links of the Dixie Highway, so as to make it available for military service. It is pointed out that even where the highway is used for commercial purposes, the service to the nation in providing roads which can be used for this purpose is just as valuable, as it releases much needed freight cars for the longer hauls, and enables business, which might otherwise be compelled to suspend on account of freight car shortage to continue as near normal as possible.

TENAILER TRUCK CO., Wilmington, Del., has been formed with a capitalization of $1,000,000 to build and deal in attachments for automobiles and trucks, by W. S. Randall, F. A. Armstrong and Clement M. Enger, of Wilmington.

BRISCOE MOTOR CORP., Jackson, Mich., has brought out a 1-ton truck which is interchangeable in a great many of its parts with the Briscoe Model 24. It has 132 in. wheelbase and is equipped with starter and windshield, and lists at $1000.

LOUIS DEF. MUNGER, New York City, has brought suit against the Firestone Tire & Rubber Co., Akron, for back royalties to the amount of $1,500,000, claiming damages through having been unable to dispose of his patents on account of the Firestone rim. This is the first suit to be brought as a result of the court's decision against the Perlman Rim Corp. in Munger's claim of infringement on his Patent No. 638,588, dated December 5, 1899.

Merit wins—that's why the CCJ is the leader

Motor Truck at the Cantonment

By CHESTER W. SHAFER

ARMY officials in charge of the construction work at Camp Custer, near Battle Creek, Mich., frequently assert that but for the motor truck, in its present stage of high efficiency, the stupendous results that have been achieved in less than four months could not have been accomplished in two years. Primarily, American vigor and push backed by the keen initiative of government officials, has been responsible for the remarkable strides that have been made, but, secondarily, and close to the par of the first reason, is the motor truck. It stands pre-eminently as the greatest contributing feature of the work.

The construction of Camp Custer was begun about the middle of June. At that time there wasn't enough lumber on the ground to build a chicken coop. The plot existed only on paper. Today there are nearly 3,000 buildings in the cantonment, They are completely furnished, heated, lighted and made tenable. On November 1 there will be a population of 40,000 men at the camp. All this has been done in less than four month's time. Without the motor truck the length of time that would have been consumed is a matter for the wildest conjecture.

In one item alone, the moving of lumber, the truck established its worth. All of this lumber, 26,000,000 feet—1,400 carloads—was shipped in and spotted on government tracks. This had to be moved to all parts of the 6,500 acres in the cantonment—a section six miles square. It was unloaded, and in many cases, was placed directly on trucks and transported to destination. The remainder was piled, but every foot eventually was drawn by a truck. Nearly 500 vehicles were used and it required less than two weeks to transport this enormous amount of lumber to its proper place. A fair idea of the enormity of this task may be gained from the statistic that the lumber, placed end to end, would come within 70 miles of reaching twice around the world. If piled in squares, 12 ft. by 12 ft., it would make a stack reaching 5½ miles in the air.

Universal Use of Trucks

The trucks came in for every conceivable use. Hundreds of horses were used, but the commercial vehicles were called upon for any job that required speed. And most of the jobs required speed. In moving sanitary supplies, mess outfits, thousands of bales of uniforms and personal supplies, materials for the 20 Y. M. C. A. camps, stoves, huge stores of form sheets and clerical matter—in fact, for every detail, the truck was ordered. The amount of work done and the mileage made by the trucks can only be a subject of guessing. But it may well be figured, in the construction of a city six miles square to amply and conveniently accommodate 40,000 persons—and give them all the comforts of home, that the trucks traveled continuously, and the mileage was well up in the millions.

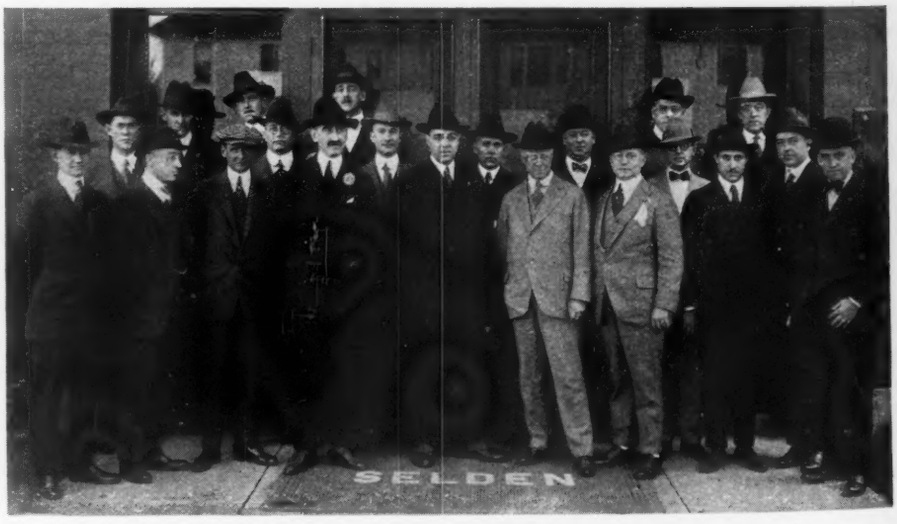
The most recent use of the trucks have come in transporting arriving squads of soldiers and their baggage. An ambulance unit recently reached the camp with 129 members, all with suitcases and handbags. It was up to them to hike nearly six miles to their barracks. They were just about to start, lugging their grips, when a big Kelly truck, a three-tonner, appeared. The entire amount of luggage, to the last bag, was piled on the vehicle, and by the time the men arrived at their destination their cases were waiting for them.

It is a common sight to see huge boilers, from 5 to 10 ft. long, with a diameter of 10 ft., weighing several tons, being snaked along the company streets on a huge truck with no effort at all. Immense stoves, built to heat barracks housing two hundred men, are hauled by twos and fours, through the avenues. Officials declare that with horses, at least two teams would be required to move one boiler, and fully five times as much time consumed in the moving.

The motor truck has been the outstanding feature of the construction of Camp Custer. It made possible the erection of this enormous city for the new national army within four months. And this means nothing, if not that it will be the big instrument, equally as important as the airplane, in bringing the end of the war nearer. Without it, the new national army could never have been mobilized, with the proper respect and consideration for the drafted men, in less than two years. As it is, the men are now enoying all the comforts of home, all the modern facilities—and these have been supplied in four months. They are now actively drilling and training, and in a very short time will be ready for service in France.

Rockwell-Drake Corporation Erecting an Addition to Its Plant

An addition to the plant of the Rockwell-Drake Corporation, Plainville, Conn., is well under way. The main building, now 130 x 100 ft., is being extended to 260 x 100 ft., with an L 130 x 100 ft. The smaller building, now 75 x 50 ft., is being enlarged to 225 x 50 ft. The company will devote its entire facilities to the manufacture of maximum-type double-row annular ball bearings, the sale of which will be handled by the Standard Roller Bearing Company, of Philadelphia, in accordance with the plans of the Marlin-Rockwell Corporation, now owning both companies.



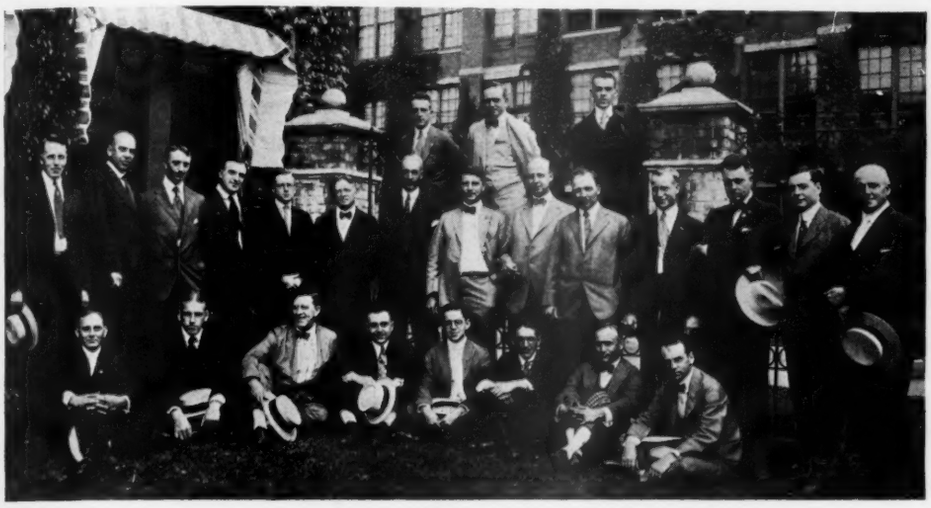
These Men Attended the Selden Sales Conference

The Annual Sales Conference of Division Sales Managers of the Selden Truck Sales Company was held at the company's general office, at Rochester, N. Y., during week of October 1st. A "surprise party," tendered to president Geo. C. Gordon, was one of the features of the meeting. At "the party" the division sales managers turned in bona fide orders totaling 156 trucks. Sales Director Boulden was presented with a silver service, as a token of the appreciation and esteem in which he is held by "the boys." The home-office organization is shown in the above photograph. Commencing with the fourth man in the front row, from left to right, is: Wm. C. Barry, Jr., factory general manager; Geo. C. Gordon, president and treasurer; Robt. H. Salmons, secretary; and Hal T. Boulden, sales director.

The CCJ is built upon the lasting foundation of honest circulation

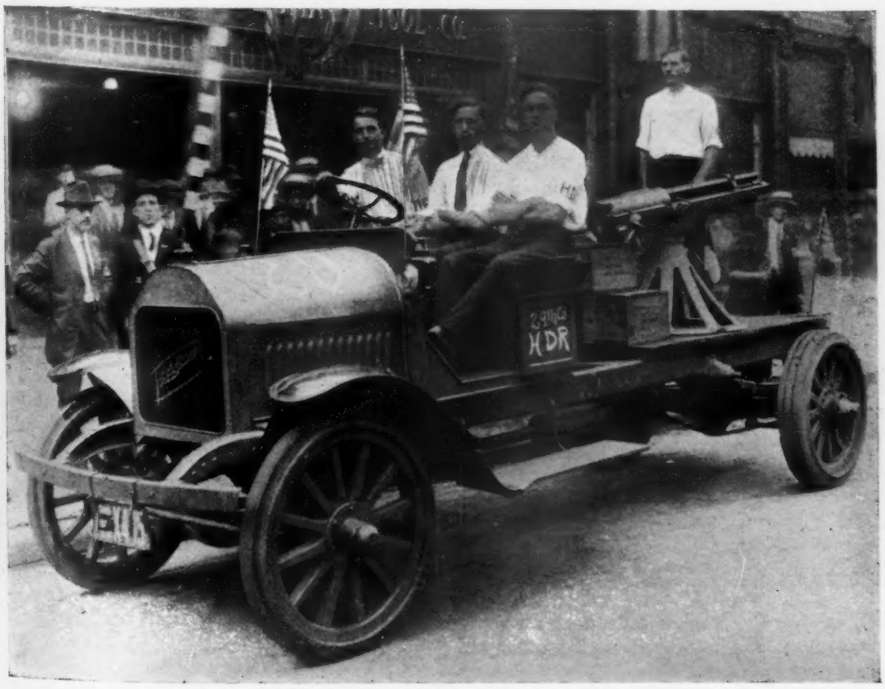
Trucks Save Loss of Sheep

The sheepmen of the Southwest have saved considerable loss during the lambing season by the use of Smith Form-a-trucks. One of the most stubborn obstacles the sheepmen have to contend with is the almost regular periods of drought. This year the drought conditions have been unusually bad and as a result the sheepmen were unable to secure the proper supply of water for their sheep. This problem has been troubling them for some time until the Roswell Buick Co., of New Mexico, came forward with a proposal to the sheepmen to use the Form-a-trucks as water carriers for this purpose. The plan seemed very feasible, particularly owing to the low cost of operation of the Smith Form-a-truck, and in a short time fifty-seven of these trucks were purchased. The work was so satisfactory and the cost so low that the sheepmen were highly pleased with their investment.



Annual Sales Conference of Standard Woven Fabric Company

Representatives and branch managers of the Standard Woven Fabric Company came from all over the country to attend the convention held at Walpole, Mass., recently. The four days were given over to a dicussion of the sales problems and plans connected with the sale and distribution of the different products manufactured by the company. Particular interest was manifested in Stanwal Brake Lining, which is the most recent achievement of the engineering staff. On the first day of the conference the men were taken on a tour of inspection through the factory. General Manager F. J. Gleason gave a review of the activities and progress of the company during the past year. President Stoughton Bell presided at the different meetings. One day was given over to the discussion of sales and advertising plans for the introduction of Stanwal.



Little Giant Truck With Machine Gun Mounted on Chassis, Used as Float in Parade of the Philadelphia Home Defense Reserve

On the occasion of the parade in honor of the conscripted men of Philadelphia, Saturday, September 1, 1917, a feature of the Home Defense Reserve division was the float of the 29th Company, represented as the gun squad. The truck was loaned by the Philadelphia representatives of the maker, the Chicago Pneumatic Tool Company, and the gun by the Government.

Aroused and Arousing Others Against Pirate Parts

The Hupmobile uses the Atwater Kent ignition. A while ago the Hupp Motor Car Corporation wrote the Atwater Kent Manufacturing Works that several times parts had come in used for Atwater Kent repairs that they knew were not from the factory, being of decidedly inferior quality. The Hupp Co., itself a sufferer from the pirate parts business, in this way called the Atwater Kent people's attention of the danger to their reputation.

This letter proved to be the last straw in arousing the Atwater Kent Works and they are now circularizing all car manufacturers using their ignition, all makers of ignition equipment, all jobbers of their equipment and official repair stations, as well as the trade papers, urging their cooperation in exposing and suppressing this trade menace.

As these letters indicate, "the sale of 'fake' parts for automobile accessories has assumed disturbing proportions. Not only does the sale of such parts affect the sale of legitimate parts, but the class of material sold is of such an inferior and inaccurate nature as to seriously affect the function and reputation of the most reliable goods. This is particularly true of such material as carburetors, gears, springs, battery parts, magneto parts and the parts of practically all ignition systems. The principal reason why these parts are sold is that in practically all cases, they are sold for very much less than the genuine article, sold cheap because they are made cheap."

The letters also ask their recipients to write the National Automobile Chamber of Commerce, the Motor Accessory Manufacturers and the National Association of Automobile Accessory Jobbers, urging them to take part in the campaign to stamp out the malignant pirate parts evil.

The Atwater Kent Manufacturing Works is already using the most effective weapon that can be used against the making of bogus parts, by selling their repair parts low enough to compete with the pirates, so as to protect the interests of their jobbers and repair stations and assure car owners the best results from their products. This done, if a campaign of education be undertaken to show dealers first and consumers next that, quality for quality, the manufacturers' price is the lowest, this evil will die a natural death. It will exist, however, just as long as manufacturers (and we must admit that many still do) charge exorbitant prices for repair parts, greedily seeking an extra profit from the owner who has suffered enough in having the repair become necessary. Manufacturers should handle repair work at just enough to insure covering its cost, and depend upon their profit from the sale price of the original goods. It is the surest way of building up a good reputation and the drawing of business, because it means pleased customers.

MIXRITE CARBURETOR CO., Decatur, Ill., has been formed by Chas. H. Gillespie, A. A. Granger and Edward H. Williams.

Make your product pay—advertise in the CCJ

Selden Army Bakery Truck

A portable bread making machine is being demonstrated at the Presidio at San Francisco, and if the War Department approves, it is possible that the American soldiers may have fresh bread at any and all times. At present there is no way of keeping the soldiers supplied with fresh bread when at the front, but with such a machine as James Garvey has designed, mounted on a powerful Selden chassis, this difficulty will be relieved. It will completely make a loaf of bread, performing all functions customary to hand work. It mixes the dough, molds any shape desired and divides it into loaves of predetermined weight. Whatever adjustments are necessary to change weights and molds are made by a hand wheel control.

The bread ingredients are put into an automatic mixer and at the proper time are discharged into troughs and allowed to raise. When properly aged the dough is fed into an automatic divider and molder and is kneaded as it passes through by chain-operated belt conveyers.

The capacity of the output is: minimum, 3000, and maximum, 6000 loaves of any size, weight and shape desired in one hour. With five men employed it will do the same work that 112 men are now required to perform the same functions in the army. In addition, the dough is machined in a sanitary manner, the finished loaves being discharged into baking pans ready for oven.

The outfit weighs three tons and is mounted on a standard three and one-half ton Selden truck. The truck body measures seven and one-half feet by twenty feet, with a six foot drop extension in the rear, nine and one-quarter inches below the other part of the body. The rear end is lower so that the bread can be panned at standing height. There is the ordinary baker's cabinet and platform work bench. When in transit the bench folds up, forming one side of the body. There is a top over the entire outfit and when set up for operation it is covered by a canvas tent twenty-four feet wide and twenty-eight feet long. Provision is made for carrying portable army ovens, bread racks and pans. When in camp the bread making machine is operated by the truck's engine.

Ball Bearing Bureau Advises United States

The Ball Bearing Manufacturers Engineering Bureau, 321 Southern Bldg., Washington, D. C., has been formed by a number of prominent ball bearing manufacturers including the Fafnir Bearing Co., Gurney Ball Bearing Co., Hess Bright Mfg. Co., New Departure Mfg. Co., Norma Co. of America, S. K. F. Ball Bearing Co., Standard Roller Bearing Co. and the U. S. Ball Bearing Co., for the sole purpose of giving advice and information to the Gov-Government and making recommendations and layouts wherever bearings are involved, and to offer the Government a quick and easy means of obtaining technical advice. No reputable ball bearing manufacturer who wishes to participate shall be excluded from the benefits of the bureau. The representatives of the bureau are J. H. Baninger and H. Wickland. The Government will thus be provided with one single competent source of information, and behind the recommendations these gentlemen may make will stand the combined technical ability and producing capacity of the largest ball bearing manufacturing concerns in the country.

FALLS MOTORS CORP., Sheboygan Falls, Wis., has secured a large order for engines and engine parts for the Curtiss Airplane Corp. The initial order calls for 5000 engines.

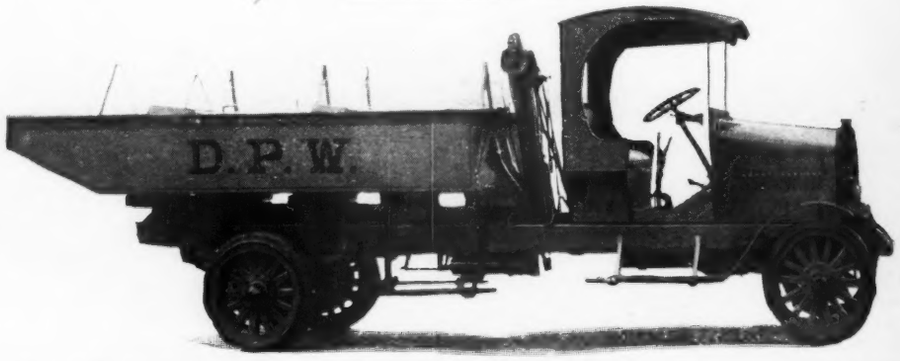
THE GENERAL MOTORS CO. shows net profits for the fiscal year ending July 31st of approximately $30,000,000, as compared with $28,789,560 in 1916. The output of the year just closed was 185,000 cars, and plans for the coming year will provide for the production of 250,000 by the General Motors Companies. The company has at the present time about $15,000,000 cash on hand and is working its plants to capacity.

Gasoline Up More in England

Gasoline prices in the United Kingdom have been advanced 17 cents. Hitherto the average retail price has ruled at about 80 cents to the gallon, now it is about 97. This unheard of figure is mainly due to the increased cost of insurance. Two weeks previously the Government's scheme of war risk was considerably modified, so that while the position of owners of requisitioned ships was improved, insurance on the "free" ships had to be considerably increased. This, and the greatly increased capital value of shipping on which the insurance has to be paid, is said to account for the increase.

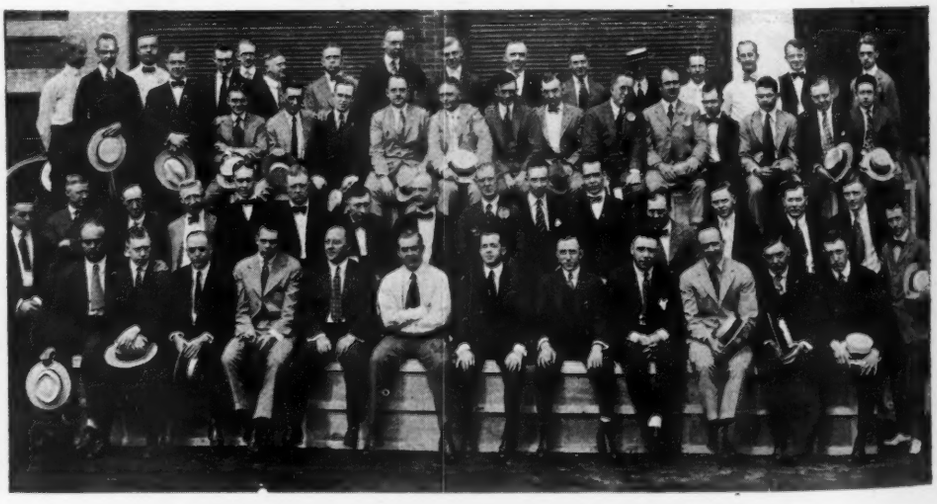
Simultaneously with the advance of gasoline, the price of kerosene and other petroleum products is being increased, and as a result there is already talk of increasing taxi-cab fares in London from 16 to 24 cents a mile.

THE JORDAN MOTOR CAR CO., Cleveland, Ohio, will shortly embark in the assembly of trucks from units of good quality



One of the Sanford Garbage Trucks in Use by the Department of Public Works, Syracuse

This truck, fitted with special body, is of three and a half tons capacity. The city of Syracuse has been using Sanford trucks for the last three years and is reported contemplating further purchases for the department next spring.



Convention of United States Truck Tire Salesmen

United States truck tire salesmen, to the number of seventy, recently gathered in a two-day convention at the solid tire factory at Providence, R. I., to work out thoroughly their plans for increasing business during the coming year and to arrive at a closer understanding of details. Much of the time of the three business sessions was devoted to a discussion of the many angles that will be met in the company's new policy of making a special drive to sell more tires through its regular established dealers who already carry pneumatics for passenger cars, and to ways in which the business can be encouraged. During a trip through the factory, each operation in the manufacture of a truck tire was shown to the men, and the extensive laboratory and the many methods used to check up qualities and processes made a special impression.

The Audit Bureau of Circulations means Circulation Facts—not Unverified Claims.

Personal Items

A. M. Armstrong has been placed in complete charge of production of the Fulton Motor Truck Co., Farmingdale, L. I. He was production manager of the American Locomotive Co. when that firm built motor trucks, and he was more recently production manager of the Wright-Martin Aircraft Corp. and the Simplex Automobile Co.

Hugh Chalmers, president of the Chalmers Motor Co., Detroit, is now first vice-president of the N. A. C. C., taking the place of Wilfred C. Leland, who has left the automobile industry to enter the aeronautical motor industry, as one of the owners of the Lincoln Motor Co., Detroit. H. H. Rice, of the General Motors Co., was elected vice-president of the gasoline division.

Hiram Clark, distributor of the United States motor trucks in Middletown, O., is erecting a show room and service station for owners in his territory.

Guy Core is now advertising manager or the Briscoe Motor Corp., Jackson, Mich. He was formerly advertising manager of the Redden Motor Truck Co. and succeeds Robt. T. Walsh.

G. P. Dean, former manager of the Baltimore branch of the B. F. Goodrich Co., has been promoted to the truck tire department of the Philadelphia branch.

Captain Harold Marmon has returned from his trip to England, France and Italy, where he went to visit the aviation factories and study the problems of aviation. He has taken up his headquarters in Washington in the Bureau of Standards, where he will carry on the work done by Jesse G. Vincent. Mr. Vincent will continue his work on the testing fields.

Geo. Mathews, Potsdam, N. Y., has taken the agency for the Nash and Jeffery passenger and commercial cars.

H. B. O'Brien, formerly with the Republic Truck Co., has been appointed truck salesman for the H. Barcroft White Corp., Syracuse, N. Y., distributor of Nash trucks.

Chas. E. Pagett has become vice-president and director of sales of the Federal Truck Co., St. Louis, Mo.

P. D. Sampsell has been appointed district representative of the United States Motor Truck Co., and has opened offices in Indianapolis.

Truck Engineering Co., Cleveland, Ohio., has been consolidated with the Olstyn Carriage Co. and the Central Wagon & Auto Co. Officers and directors are: A. V. Cannon, F. M. Greeg, H. G. Hascall and M. T. Gardner.

Auto Pull Co., Glencoe, Minn., has been sold out to the Curtis Form-a-Truck Co., Chicago.

Bessemer Truck Co. has moved to larger quarters at 1129 Main St., Buffalo, N. Y.

Interstate Engine & Truck Co., Waterloo, Ia., changed its name to the Interstate Tractor Co.

Bigsby Mfg. Co., Cleveland, O., has changed its name to the Vital Mfg. Co., and will continue to make a complete line of standard spark plugs.

Garford Motor Truck Co., Lima, O., has combined its sales and service department into one unit and under one head, in order to render better service.

Wichita, Kans—Resser Motor Co., agent for the Smith Form-A-Truck, has moved to 118 N. Lawrence St.

Charles W. Newhouse has been appointed district sales manager of the Garford Motor Truck Co., with all of Northern California and Nevada under his charge.

George C. Gordon

President and treasurer of the Selden Truck Sales Company, Rochester, N. Y. He has been connected with the motor truck industry for the past five years.

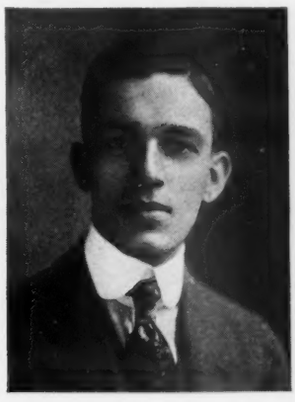
Trade Changes

American Brass Foundry Co., Milwaukee, Wis., has changed its name to The American Metal Parts Co. There will be no changes in the policies or personnel of the company, except that S. A. Fulton, president of the Fulton Co., has purchased an interest in the business and is now an officer and a director. The entire sales of the company's products will be handled exclusively by the Fulton Co., Milwaukee. All sales correspondence, inquiries and orders should be directed to the Fulton Co., 726 National Ave., and all remittances and correspondence relative to accounts should be directed to The American Brass Co., 1916 St. Paul Ave.

E. B. Hayes Axle Co., of Oshkosh, Wis., has moved to Grand Rapids, Mich. The company, which is capitalized at $500,000, is erecting a factory at a cost of $100,000. The Hayes Axle Co. is the outgrowth of the Hayes Machinery Co. and manufactures 2½- and 3-ton truck axles. It is proposed to raise $350,000 by the sale of preferred stock.

Willard S. French

Director of sales of the Monarch Governor Company, Detroit. He was formerly with the C. S. Von Poetgen Advertising Agency, and at one time advertising manager of the Denby Motor Truck Company.



Bearing Service to Open New Bearing Service Stations

The Bearing Service Company, has appointed three traveling representatives—Harold Perkins, T. L. Hutchinson and B. H. Boensch—who will establish some 450 agencies through the country within the next year. The United States, east of the Rockies, has been divided into three sections in charge of these men, who started on September 20 from Boston, Kansas City and Detroit to inaugurate the work in these three branches. When they have completed the work of organization in these territories, they will move on to other branches in their respective sections, establishing agencies in a number of towns in each branch's territory. These connections will be with responsible firms who will be fully supplied with all technical Bearing Service data and who will represent the company in its immediate locality.

A. R. Cosgrove

Has been appointed sales manager of the Atlas truck division of the Martin Truck and Body Corporation, of York, Pa. He is widely known through extensive dealer organization work. The Martin Corporation manufactures the Atlas commercial car, built in thirty-five different body types.

THE COMMERCIAL CAR JOURNAL is the only truck journal a member of the Audit Bureau of Circulations—"There's a reason."

New Truck Company Formed

The Air-O-Flex Automobile Corp., of Detroit, has been formed with a capitalization of $2,500,000 to manufacture a 1½-ton truck, embodying a new type of pneumatic suspension cylinders which replace automobile and motor truck springs. Of the $2,500,000 authorized capitalization, the Michigan Securities Commission, after thorough investigation, has permitted the company to sell $2,300,000 worth in the state of Michigan. Offices have been opened at 570 Penobscot Bldg. The officers of the new concern are: Geo. M. Walker, Jr., president; O. C. Kreis, chief research engineer of the Continental Motors Co., vice-president and chief engineer; George L. Nadle, attorney and real estate man, secretary, and Robert A. Weinhardt, assistant chief engineer of the Continental, treasurer. A. B. Hanson, formerly service supervisor of the Chalmers Motor Co., manager of the Service Motor Truck Co., and general manager and assistant to the president of the Standard Motor Truck Co., is production manager and also a director. In addition to the manufacture of a 1½-ton truck, it will engage in the production of the newly patented Air-O-Flex suspension cylinders for other firms in both passenger and commercial industries. It will also enter an arrangement with other companies to use Air-O-Flex cylinders in their own products, building these in their own factories under license from the Air-O-Flex Corp.

Dayton Rubber Will Double Present Capacity

On October 1st the Dayton Rubber Mfg. Co., Dayton, will pay its regular quarterly dividend at 7 per cent. per annum on the preferred stock. It is making rapid strides and is running the factory 24 hours a day, reporting that sales for the first six months of this year were greater than the total of 1916.

The company has been gradually supplementing its sales force and, with opening of three new branches, will employ 50 or more additional salesmen for the coming season. Other branches in principal cities will also be opened. The pneumatic tire, which is known as the "Dayton Thoroughbred," is put out on a quality basis, backed with a sales and advertising campaign that will assure a dealer of a rapid turnover. An extensive national advertising campaign has been outlined, covering all national periodical farm papers and a large list of trade papers. The new plant, which is about completed, will enable the company to double its capacity.

United States Truck Sales Co., Cincinnati, has been formed with a capitalization of $10,000 to deal in motor trucks. The incorporators are: Arthur M. Beck, Stanley Shaffer, John L. Shuff, Frank H. Shaffer and John Weld.

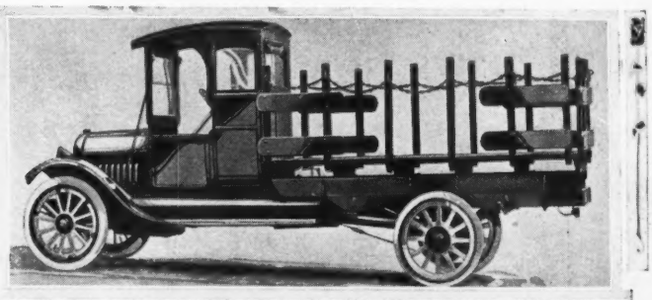
Automatic Control Trailer Co., Columbus, O., is operating a plant at the Broad Oak Automobile Co. for the manufacture of trailers and also for the manufacture of the patented automatic brake to be placed on any make of trailer. Tom C. Curtin and H. C. Rogers are at the head of the company.

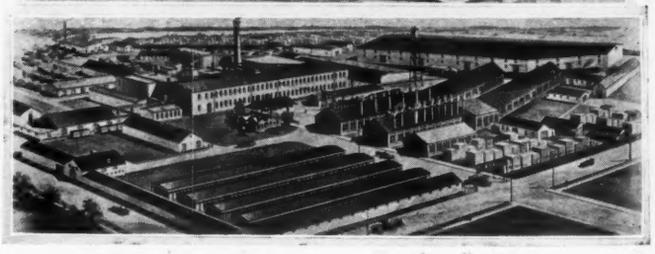
Republic Motor Truck Company Doubles Output

The output of the Republic Motor Truck Co., Alma, Mich., will be doubled. To this end the company will secure over a million dollars additional cash by the sale of 23,675 shares of stock held in the treasury unissued since the increase of the stock to $100,000. The money thus received will be added to the working capital. It has been decided that a disbursement of dividends at this time is unadvisable, but dividends on common stock are expected to start during the present fiscal year. During the fiscal year the company sold 12,914 trucks; the total volume of business, including the sale of parts, was over $12,000,000.

United States Motor Truck Co., Cincinnati, O., has been awarded contract for trucks (which may amount to from 300 to 400 trucks) by the Post Office Department at Washington. E. C. Shumard, engineer of the truck company, made a trip to Washington, where he explained the construction of the U. S. truck in full.

The New Turnbull Motor Truck Company, Its President, Plant and Product





Above are shown the new Turnbull one and a half ton truck, a part of the plant, located at Defiance, Ohio, and W. O. Allen, president of the new concern, and treasurer and general manager of the Allen Motor Company, Fostoria, Ohio.

Factory News

Detroit Motor Truck Co., Detroit, has recently acquired a large factory, which will be used exclusively for the manufacture of truck units for converting Ford cars into one-ton trucks.

Ericsson Manufacturing Co., Buffalo, N. Y., is erecting an addition to its plant which will double the present capacity. This increase will be devoted to the manufacture of Berling magnetos, the main product of the company. Plans for still further expansions are under consideration.

Fageol Motors Co., Oakland, Cal., has completed the first unit of its plant, which is complete in every detail and contains the newest manufacturing devices. The manufacture of Fageol trucks has been commenced.

Romeo Foundry Co., Port Huron, Mich., is building a $200,000 addition to its factory which will be used for the manufacture of motor vehicle castings.

Schwarz Wheel Co., Frankford, Philadelphia, announces that its capital stock has been increased from $200,000 to $300,000 and the following officers have been elected: S. Vance Lovenstein, president and general manager; L. J. Kolb, vice-president; J. H. Loucheim, treasurer; Chas. Q. MacDonough, secretary. The fiscal year, ending June 30th, was the most successful year in the history of the company.

New Agencies

H. J. Koehler Motors Corp., Newark, N. J., has recently appointed the following agents: George J. Cooney, Prop. Lumberton Garage, Lumberton, N. J.; H. D. Healey, Clearfield, Pa.; J. C. Henry, Somerville, N. J.; Reading Engineering Works, 116 Washington St., Reading, Pa., S. N. Seibert, Mgr.; Jos. Scrivani, The Motor Shop, Wildwood, N. J.; Evatt & Wilson, 614 Louisiana St., Little Rock, Ark.; Jas. L. Walls, Batavia, Ohio; H. E. Bailey, Prop. Lincoln Highway Garage, Wrightsville, Pa.

J. W. Leigh Motor Co., St. Louis, Mo., Apperson dealer, has taken the distribution of the Rainier half-ton truck for southern Illinois and eastern Missouri. The company has removed to increased space at 3033 Locust St.

Linscott Motor Co., 566 Commonwealth Ave., Boston, Mass., has taken the Republic Truck distribution for Maine, New Hampshire, Vermont and eastern Massachusetts.

Mark Nabors Motor Truck Co., Atlanta, Ga., Federal dealer, has taken the agency for the Rainier half-ton truck for Georgia, Florida and South Carolina.

New England Velie Co., Boston, has been appointed distributor of the Rainier half-ton truck for Massachusetts, Vermont, Maine, New Hampshire and eastern Connecticut.

Glen and D. Trimple, Fulton, N. Y., have secured the agency for the Jeffery and Nash passenger and commercial cars.

Advertising appropriations bring greatest returns when expended in the CCJ

THE COMMERCIAL CAR JOURNAL

Entered as second-class matter at the Post Office at Philadelphia, Pa. under the act of March 3, 1879

Vol. XIV PHILADELPHIA, OCTOBER 15, 1917 No. 2

Published the 15th of each month by the

CHILTON COMPANY

Market and 49th Streets Philadelphia, U. S. A.

JAMES ARTMAN, President C. A. MUSSELMAN, Treas. & Gen'l Mgr.
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The Commercial Car Journal is a Member of the Audit Bureau of Circulations

Get Ready for Snow Removal

AN example of preparedness is the way the New York City municipal authorities and transportation interests are getting together and laying plans for keeping the city streets clear of snow next winter. An account of this is to be found on another page of this issue and well deserves the notice of those in other large cities where business is hampered in the winter by the crippling of transportation facilities due to snow.

Not very much can be done while the snow is actually falling perhaps, but the principal mischief done to city business is the length of time it keeps traffic tied up while it is being taken away. With men and equipment organized to tackle the job promptly and with an overwhelming force, it is a case of "many hands making light labor" and the streets can be cleared in short order.

The Motor Truck Club certainly is to be complimented for the effort it has taken through its special snow removal committee to have the necessary authorities thinking ahead to snow time and it was an inspiration to have suggested the co-operation of those with trucks to be borrowed rather than to depend on the city to provide all of its own vehicles. It would be entirely out of the question for the city to have enough equipment to do the work quickly on account of the large part of the year it would have to be held idle. On the other hand, the interests who are going to profit by having the streets cleared quickly can very naturally be expected to be ready to co-operate by lending their trucks for a proper compensation.

Realizing that protection against snow in a city means next to as much as protection against fire, if not that also, for in the event of a fire with the streets blockaded the result might be serious, it is not inappropriate that the Truck Club is proposing what amounts almost to a fire drill in having private companies' equipment and men available for an emergency call much like a village volunteer fire department, although paid for the work. Another analogy might be a snow militia or a traffic defense reserve. Surely the idea deserves the consideration of all the larger cities.

Winter Accessory Business

DEALERS in accessories and supplies count probably too little on the patronage of commercial car users. There are several reasons for this: The private passenger automobile antedated the motor truck and still far outnumbers it, and individuals will indulge their desire for luxuries for personal use where they would not tolerate such extravagance in business. It is not to be forgotten, however, that very many accessories once looked upon as luxuries are now regarded as almost if not quite necessities. Anything which increases the convenience or efficiency of a motor car, particularly a commercial one, is an investment, and if the market for it does not offer itself it should be developed by the usual means—various forms of advertising to educate the uninformed.

When it comes to winter accessories, and this is the time to consider stacking them, it may seem again that the passenger rather than the delivery car field is the obvious one to cultivate. So far as tonneau heaters, fur robes and such accessories are concerned, this may be true, but inasmuch as the delivery car must run regardless of season, such things as the commercial car driver can use to advantage in the winter are sure to be in demand—radiator non-freezing mixtures, grades of oil that will stand cold temperatures, anti-skid chains, hood and radiator covers, windshields, side curtains, gloves, caps and other things to add to the comfort of the driver. It is not hard to make an employer realize that his drivers will do more and better work when they are comparatively comfortable than when they are in agony from exposure, to say nothing of the time that is likely to be lost from work when they are sick. They will make less mistakes in their delivery work, as they will be less in a hurry to get out of the cold, and they will be physically and mentally in better condition to avoid accidents if they are not numb with cold or in such bodily discomforts that they can think only of their suffering.

These facts have all been demonstrated with regard to the motormen of our electric cars that many states and municipalities now have laws requiring the motormen to be protected

and enclosed from the weather. The same arguments can be used to help sell winter accessories for commercial drivers. If the dealers will only realize it, the men who have to go out rather than those who can stay home if they want to, are the kind who will buy, or for whom their employer will buy, the real needs rather than fancies.

Shortage of Truck Drivers

A LITTLE piece of good work that commercial car dealers can engage in for the next little while is the encouragement of competent men to take up the vocation of driving motor trucks.

Every indication is that there is going to be an increased sale of motor trucks and delivery cars of all kinds and with the rank of truck chauffeurs already depleted by those who have enlisted, it is very evident that there is going to be a paucity of truck drivers, which is borne out by the article on another page by S. V. Norton on "The War's Effect on Motor Truck Industry." This article is well worth reading clear through, though it is fairly long, because it is a very thoughtful review of the present situation and brings out many interesting points, all pointing to the prospect for growth in commercial car business.

The next most important thing to think about after getting the needed greater number of truck drivers, is the menace they will be to the safety of the public and other drivers until they become competent. Too much stress cannot be laid on the necessity of using every precaution to properly train these men, or women, if women come into the field, not only for the sake of the safety of lives and limbs, but for the economy of decreased property damaged.

There would seem to be a splendid opportunity for some enterprising truck dealers to make themselves and their products popular by instituting efficient courses in truck driving instructions.

Metal and Rubber Markets

Steel Supply Absorbed by Government

Much private business has been sidetracked due to the heavy requirements of the Government for steel.

As illustrating the heavy demand upon steel producing companies outside of their private engagements, it is estimated that 7,000,000 tons of steel products will represent the tonnage to be requisitioned by the Government and the Allies during the next two months for delivery within the next twelve months.

Quotations on October 6th were:

Steel Products Prices

Bessemer billets, per ton, mill.	$60 00 a 65 00
Open hearth, per ton, mill....	60 00 a 65 00
Sheet bars, per ton	70 00 a 75 00
Forging billets, per ton, mill..	90 00 a100 00

SHEETS

The following prices are for 100-bundle lots and over f. o. b. mill; smaller lots are $2 per ton higher. For open hearth stock add $5 per ton:

Blue Annealed Sheets—	
Nos. 3 to 8	$8 00 a 8 50
Nos. 9 to 10	8 25 a 8 50
Nos. 11 and 12	8 50 a 8 75
Nos. 13 and 14	8 75 a 9 00
Nos. 15 and 16	9 00 a 9 25

No. 17 and lighter gauges are based on $6 50 a 7 50 per 100 lbs. for No. 28 Bessemer Black sheets.

Box Annealed Sheets, Cold Rolled—	
Nos. 17 to 21	$8 30 a 8 80
Nos. 22 and 24	8 25 a 8 85
Nos. 25 and 26	8 40 a 8 90
Galvanized Sheets of Black Sheet Gauge—	
Nos. 10 and 11	$8 50 a 9 00
Nos. 12 to 14	8 60 a 9 10
Nos. 15 and 16	8 75 a 9 25
Nos. 17 to 21	8 90 a 9 40
Nos. 22 to 24	9 05 a 9 55

Above prices are for Bessemer stock. For open hearth stock $2 per ton advance is charged.

Tin—Mill Black Plate—	
Nos. 15 and 16	$7 80 a 8 30
Nos. 17 to 21	7 85 a 8 35
Nos. 22 to 24	7 90 a 8 40
Nos. 25 to 27	7 95 a 8 45

IRON AND STEEL AT PITTSBURGH

Bessemer iron	$36 30 a ....
Bessemer steel, f. o. b. Pittsburgh	75 00 a ....
Skelp, grooved steel, nominal	4 00 a 4 50
Skelp, sheared steel, nominal	4 50 a 5 00
Ferromanganese (80 per cent)	400 00 a415 00
Steel, melting scrap	42 00 a 45 00
Steel bars	4 00 a 5 00
Manganese ore, per unit ..	1 00 a ....
Wire rods	90 00 a 95 00

Finished Products

Mills and brass foundries continue to work at capacity and demand for all brass and metal products is heavy. Prices, however, are too uncertain for manufacturers to quote except on specifications, so that all published quotations are merely nominal for the time being.

Sheet zinc	$19 00a ....
Sheet aluminum, 1917 contract	42 00a ....
do, outside market contracts	65 00a75 00
do, outside market prompt ship't	75 00a80 00
Aluminum wire, outside market prompt shipment	70 00a75 00
Copper wire	30 00a32 00
Sheet copper, hot rolled	35 00a37 00
Sheet copper, cold rolled	36 00a38 00
Copper in rods	38 00a ....
High brass sheet	31 25a32 25
High brass wire and light rods	31 25a32 25
High brass heavy rods	28 25a30 25
Low brass sheet, wire and rods	36 75a ....
Bronze sheet, wire and rods ..	50 25a50 50
Brazed brass tubing	44 75a45 75
Brazed bronze tubing	48 25a48 50
Seamless copper tubing	42 50a45 50
Seamless brass tubing	39 90a43 00
Seamless bronze tubing	52 00a ....
Full lead sheets	11 75a ....
Cut lead sheets	12 00a ....

ALUMINUM.—There is no change in the condition of the market which remains dull and rather easy, at the current prices. Virgin No. 1, 98 to 99 per cent. is quoted 39 a 41c.; pure remelt, 98 to 99 per cent., at 37 to 39c., and No. 12 alloy at 29 to 31c.

TUNGSTEN.—Demand continues active, and the market is firm at unchanged prices. Wolframite is quoted as to quality at $23 to $25 and Scheelite at $26 per unit for the highest grade on the basis of 60 per cent. metal or 30c. per unit additional up to 65 per cent.

OLD METALS.—The following prices are current for old metals:

	Cents per pound Buying.	Selling.
Copper—		
Heavy cut and crucible	24.00a24.50	26.00a26.50
Heavy and wire	21.50a22.00	24.00a24.50
Light and bottoms..	20.00a21.00	22.00a22.50
Heavy machinery comp.	23.00a23.50	24.00a24.50
Brass, heavy	14.50a15.00	16.00a16.50
Brass, light	11.50a12.00	13.00a13.50
Lead, heavy	...a 7.00	7.62½a 7.75
Tea lead	...a 6.00	6.37½a 6.50
Zinc scrap	5.50a 6.00	6.50a 6.75

The buying prices are those which the larger dealers will pay; the selling prices are market quotations.

Rubber Prices Decline

Since our last writing the prices of crude rubber have fallen a few cents. A dull and easy tone has also been noted in centrals. Quotations on October 6th were:

Para—Up-river, fine, per lb....	65½a 66
Up-river, coarse	44½a 45
Island, fine	53½a 54
Island, coarse	28 a 29
Caucho, ball, upper	39½a 40
Caucho, ball, lower	26 a 27
Cameta	29 a 30
Ceylon—First latex, pale crepe.	65 a ..
Brown crepe, thin, clean ..	57 a 59
Smoked, ribbed, sheets ...	64 a 64½
Centrals—Corinto	41½a 42
Esmeralda	41 a 41½
Guayule, Satillo	32 a 34
Balata, sheets	77 a ..
Balata, block Ciudad	67 a ..
Balata, block Panama	48 a ..
Mexican—Scrap	39 a 40
Frontera	39 a 40
African—Massai red	50 a ..

DOMESTIC SCRAP RUBBER

Prices paid by dealers for scrap rubber were as follows:

Tires—Automobile	6¼a 6⅝
Bicyles, pneumatic	4¾a 5
Inner tubes, No. 1	23 a ..
Inner tubes, No. 2	11¼a 11½
Red	11½a 12

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Snow-Removal Problem in New York

CO-OPERATION—and lots of it—between the New York City municipal authorities and transportation interests in general must be evidenced before the solution of Gotham's snow-removal problem can be begun. The seriousness of the situation every winter and the monetary loss occasioned by a tie-up of traffic, due to the inability to remove the heavy falls of snow quickly, means that a great deal of planning and organization work must be done before any feasible method of overcoming the present difficulty can be decided upon.

The above in substance is the first report of the Special Snow Removal Committee of the Motor Truck Club appointed by President Stephens. The committee consists of G. A. Green, chairman; E. H. Nelson and J. K. Orr.

Confer With Commissioner

At a conference with J. T. Fetherston, Commissioner of the Street Cleaning Department, the snow-removal problem was thoroughly discussed, with particular reference to securing co-operation between transportation interests and the Department of Street Cleaning. The consensus of opinion of those familiar with the transportation of materials in the city was to the effect that the merchant and producer of articles to be transported hold the key to the situation.

It was agreed that it would not be possible to divert motor trucks from the work of removing incoming freight, particularly food and coal, no matter what traffic conditions might exist, short of a total blockade, but that it might be possible to furnish trucks for a limited period for purposes of snow-removal in great emergencies, provided an embargo on outgoing freight could be declared for a corresponding limited period. The interests concerned in transportation are: 1. The producer of freight; 2. The agency of transportation; 3. The city officials responsible for traffic conditions and for the removal of snow. The committee recognized the fact that the Department of Street Cleaning had organized every available force which could be placed at the service of the city for rapidly removing snow, but that in the event of an extra heavy fall, traffic will not only be seriously blocked, but likewise all interests concerned will be subject to severe losses.

Co-operation Vital Necessity

A co-operative plan for bringing all of these interests together will resolve itself into some form of regulation or law by which an embargo can be placed on outgoing freight for a limited period, thus freeing the transportation companies, or a part of their equipment for use in the removal of snow.

The committee suggests that a conference be called by some authoritative body, so that those affected by transportation delays or blockades may be brought together and a definite plan devised for meeting such emergencies. By a campaign of education initiated through such a meeting it would be feasible to devise some plan or procedure which should ultimately benefit all those concerned or affected by snow tie-ups.

The Committee's Suggestions

In regard to the co-operation it is suggested: 1. That transportation interests be prepared to assign some proportion of their total horse-drawn and motor driven equipment for service in emergencies, to relieve snow blackades; 2. That this equipment be made available in conjunction with the regular force of the Department of Street Cleaning, and on call by some authoritative official, such as the Commissioner of Police; 3. That the Department of Street Cleaning organize and supervize the work of the companies furnishing the transportation equipment and likewise arrange to pay for such service; 4. That merchants agree to furnish a certain proportion of their janitors or other handlers, whose services might be spared during emergency periods, so that the force thus provided could be utilized in loading the trucks of the transportation concerns; 5. That as far as possible the regular drivers of the transportation interests should be employed in this work and some incentive offered to these men so as to secure their full co-operation in rapidly clearing the streets of snow and, 6. That local transportation companies, such as those engaged in hauling coal, be provided by the city with detachable plows and that such companies agree with the city to furnish a portion of their motor driven equipment to plow snow from roadways contiguous to their place of business, following the plans initiated by Z. O. Nelson & Sons, of Brooklyn.

The Street Cleaning Department's schedules for snow removal by boroughs, are as follows:

Area From Which Snow Must be Removed

	Area Sq. Yds.	Miles
The Bronx	3,774,456	106.89
Manhattan	16,287,300	462.6
Brooklyn	13,250,053	376.68
Totals	23,311,809	946.17

A 12-in. fall of dense snow, 30 lb. per cubic foot, would effectually block traffic on at least 605 miles of the total area scheduled for snow work for at least 1 day, in the opinion of the Street Cleaning Commissioner, and retard traffic for at least 6 days, resulting in immense losses to merchants and transportation interests, not to speak of the fire hazard which might result in a serious conflagration.

To meet such a condition and minimize the risks as well as the losses entailed would require in addition to the maximum force procurable by the Department of Street Cleaning the services of at least 10,000 trucks for a period of about 24 hours to restore normal traffic conditions in districts where heavy traffic prevails. These figures are approximate, because weather conditions are so variable that a larger or smaller force might be required to meet the emergency.

The committee is of the opinion that plans should be drafted and a program adopted by the transportation interests, the merchants and the City officials. Such plans would minimize or prevent the losses which inevitably occur when an extraordinary deep fall exceeds the resources of the snow removal division of the Street Cleaning Department. The conference suggested above would be a starting point in this connection and if the co-operation of all concerned could be secured it would undoubtedly be possible to draft some form of law or ordinance which will redound to the benefit of all concerned.

Republic Truck Used for Street Advertising to Stimulate National Guard Recruiting in Los Angeles, Cal. The Truck Was Loaned by D. F. Poyer, the Republic Distributor in Los Angeles

Everybody who is anybody in the truck industry reads the CCJ

Progress on U. S. Standard Military Truck

The Standard Truck Has Been Created With a Speed Unprecedented in the History of Commercial Car Design

DECIDED on in July, designed in August, built in September, tested in October, this is the tale of the U. S. Standard military truck to date. And now the production in quantities is the next stage and plans for it are already in hand so that an immense number will be ready in the spring. As everything so far has been done in as many days as it usually takes weeks or longer to do, there is little doubt of the army having its equipment by the time needed.

In the August issue considerable space was given to the military truck and it was related how the talent of the country was to be drawn upon for its design and construction. For the first, fifty experienced engineers were brought from various parts of the country to Washington early in August and under the supervision of Col. Chauncey B. Baker, Capt. W. M. Britton and other officers were started on the task of designing the Class A and Class B trucks, rated at 1½ and 3 tons capacity respectively, but corresponding to 3- and 5-ton trucks as usually commercially rated. Interchangeability has been the keynote and it has been carried down to the smallest details so that repairs in the field may be made as expeditiously as possible and without carrying a larger stock of repair parts than absolutely necessary.

How the Design Was Worked Out

The fundamental designs were completed on Sept. 1. The engineers worked in groups on the various units, as engine, transmission, clutch and control, etc., and their recommendations before final acceptance were submitted to the criticism of still other truck engineers not directly engaged in the work. The sample parts for the first two experimental trucks built, one each by the Gramm-Bernstein Co., Lima, O., and the Selden Motor Truck Corp., Rochester, N. Y., were furnished in record time, especially remarkable being the time within which the engine was ready. The crankshaft die was sunk in seven days, the crankcase pattern and first casting were made in five days after receiving the drawing and the cylinder castings in five days. Three to four weeks is the time usually required for such work. And so on might be mentioned the four-speed transmission specified, which is of horizontal type and located amidships, the gear-tooth, multiple-disk clutch, the ignition equipment which is in two independent parts with separate sets of spark plugs, the rear axle, two different types of which are to be used, internal-gear and worm-gear driven patterns, etc., etc.

The seven groups of engineers who, working under Captain Britton, developed the designs of the different parts were as follows:

In less than three months from the announcement of the decision to build a completely standardized military truck under the supervision of the Quartermaster Department, the men to design it were secured, the designs made and the first two experimental models completed ready for testing. This means that there has already been accomplished what experts predicted would take more than a year.

Ever since this country got into the war its people, aroused and patriotically co-operating, have been doing things supposed to be impossible. It is this American spirit that is going to decide the outcome.

The Transmission and Clutch Group—A. W. Copland, Chairman; Geo. C. Carhart, F. Engle, A. A. Gloetzner, W. C. Lipe, W. W. Peck, S. O. White.

The Axle Group—A. W. Russell, Chairman; R. J. Burrows, G. W. Carlson, A. M. Laycock, V. V. Torbenson.

The Electrical Equipment Group—W. A. Chryst, Chairman; Joseph Bijur, O. F. Conklin, Bruce Ford, F. C. Kroeger, A. D. T. Libby, R. J. Nightingale, A. H. Timmerman, C. E. Wilson.

The Engine Group—H. L. Horning, Chairman; Chas. Balough, R. J. Broege, J. B. Fisher, W. A. Frederick, C. C. Hinkley, A. F. Milbrath, R. A. Weinhardt.

The Chassis Group—R. W. Austin, Chairman; B. B. Bachman, G. P. Dorris, L. P. Kalb, A. F. Masury, C. T. Myers, W. T. Norton, Jr., H. Palmer, C. D. Peterson, Ernest E. Wemp.

The Steering Gear Group—W. N. Osburn.

The Springs Group—W. M. Newkirk, John G. Utz.

Organization for Truck Production

Production of the 10,000 Class B and the 5,000 Class A, delivery on which is to begin January 1, is the next step and for this mammoth undertaking another set of experts has been drafted. Some reference is made in another part of this issue to the formation of the Automotive Products Section now operating directly under the War Industries Board. Headed by H. L. Horning as chairman this committee is composed of Col. Chauncey B. Baker, representing the Army; C. W. Stiger, president of the Motor and Accessory Manufacturers; Henry R. Sutphen, vice-chairman of the National Association of Engine and Boat Manufacturers; F. H. Russell, president of the Aircraft Manufacturers' Association; T. W. Henderson, president of the Motorcycle Manufacturers and Allied Trades Association; Hugh Frayne, labor representative of the War Industries Board, and Coker F. Clarkson, general manager of the Society of Automotive Engineers.

This committee having a purely advisory function, an organization directly connected with the Quartermaster Department will handle the details of production. Christian Girl has resigned as chairman of the Committee of Operation of the Standard Parts Co., Cleveland, O., to accept the position of Director of Production of Military Trucks and will have a number of supervisors and assistants to co-operate with him. These men include Guy W. Morgan, formerly general manager of the Abbott Corporation of Detroit, who will be in charge of the plant survey work, gathering data as to plant capacities for producing parts and assembling trucks; W. S. Quinlan, formerly purchasing agent of the National Screw & Tack Co., Cleveland, who will be in charge of the raw materials, to report the needs of parts makers for priority action through the Automotive Products Section of the War Industries Board; P. W. Tracy, formerly director of purchases of the Premier Motor Corp., Indianapolis, who will supervise the parts making plants, seeing that the raw materials are made into parts according to schedule; James F. Bourquin, formerly general manager of the Paige-Detroit Motor Car Co., and recently vice-president of the Liberty Motor Car Co., who will have supervision of truck and chassis assembly; John G. Utz, formerly chief engineer of the Standard Parts Co., and chairman of the S. A. E. Standards Committee, who will be in charge of the inspection work from raw materials to finished products, and A. G. Drefs, formerly efficiency expert with the Miller Franklin Co., New York, under whom will be undertaken the preparation of charts and records to show the progress from raw to finished products day by day to keep them up to schedule.

Production Men Giving Full Time

Until the work of producing the military trucks is completed these men have given up all other work, several of them working for merely a nominal salary to comply with the law, either giving their services gratuitously or having them donated by the companies with which they are regularly connected.

It is Mr. Girl's intention in carrying out the work to have the orders for the major units placed directly by the Government. These would then be shipped to the chassis makers for assembly. The men who will handle the production work are really drafted for the National Service in much the same sense as if they were in the Army. Their abilities gained through experience in industrial or private business will thus be at the command of the Government.

Plenty of the right kind of circulation means quantity results to advertisers in the CCJ

How Shall We Sell the Motor Truck?

By WARREN EUGENE CRANE

THE right way to sell a motor truck is to sell transportation service. Experience in the motor business during the past few years has proved that this is true. There was a time when a man bought automobiles and trucks just because they were automobiles and trucks and because the experience of making such a purchase was interesting and novel. Motor vehicles are no longer a novelty. Today a man is not interested primarily in the truck he is buying, but rather in the work which he has for it. In making a selection, the problem is to choose the one that will perform its duties with the greatest efficiency.

The agent who honestly presents the most feasible solution for the prospective buyer's problem makes the sale. Each argument advanced toward that end must be based on fact and the truck salesman's business procedure should be built upon a rock instead of the proverbial shifting sands.

Truck and Service Go Together

There are two principal items involved in every successful sale, the truck and the service. The customer, in making a purchase, buys both and is entitled to full value for his money in the service as well as the truck, for they should be inseparable. The dealer, in turn, is entitled to the full price for his product.

"The first thing that a prospective buyer of a truck should investigate is the business organization back of it," said J. C. Smith, of the Seattle branch of the Kelly Springfield Truck Co. "A firm to be successful must have a strong man at its head; it should have its whole interest centered in the automobile business and be a leader in a national way. It should have good credit and ample financial backing. These things form the character and help establish the permanency of the organization.

"The factory should be equipped with modern machinery and pursue modern methods. The personnel of its engineering staff should include men of high ability, and the business management should be ready to stand back of its finished product. It should make it possible for every owner to have reasonable access to a factory branch or an adequate distributing center and service station.

"It is the duty of the sales department to inform the customer of the latest developments in the motor truck world by means of letters or house organs. This shows him broader uses for his truck and tends to keep him in a close and more friendly relation with the manufacturer. These things are just as important as charging the right price of the truck."

Many people are anxious to know the character of a truck and it is advisable for the salesman to show them a table like the following one, which shows the average daily operating cost of a two-ton truck running fifty miles and the percentage that each item takes of the entire expenditure:

		Per cent.
Interest	$ .50	6.3
Tires	1.00	12.5
Depreciation	1.00	12.5
Repairs	1.00	12.5
Oil and Grease	.30	3.8
Gasoline	.75	9.3
Insurance	.20	2.5
Garage	.25	3.1
Driver	3.00	37.5
Total	$8.00	100.0

The salesman should emphasize the fact that 38 per cent. of the operating cost depends on the quality of the truck. A comparative cost of repairs may be determined by the cost and accessibility of the parts and the quality of the material used. Every progressive dealer should have actual data on upkeep costs as well as that of depreciation.

Service is just as much a reality as a truck. No agent can furnish it unless he has the proper facilities and "instruction" and "equipment" are two convenient headings under which to analyze this term.

In the first place an agent should help his customers to install a practical system for securing data on operating costs. This is essential for the agent, because it is to his interest to keep his customer's operating cost as low as possible. The agent should insist that the truck must have a competent driver, and should furnish him with every opportunity to become more efficient. As a means to that end a school for drivers is advisable.

The agent should give the truck a thorough inspection at least once a month for the first year, and a written report of this inspection should be mailed to the owner. Free coupons should be issued to cover this inspection, and also provide for a reasonable number of hours of an expert instructor for drilling a permanent driver. These coupons should provide for about seventy-five hours of work and also for adjustments and minor repairs, but not for heavy shop work.

The instruction should include advice on the best ways to use the truck equipment to best advantage. Data on the experiences and performances of men in the same line of business is very useful. Intelligent advice on insurance as well as the protection of a customer's interest in case of insurance adjustments is service that is worth rendering.

In the second place the repair shop should be well equipped and operated by a competent truck repair man who should be a specialist on the dealer's particular make of truck. Night service at regular day prices is an aid in holding the good will of the customer.

Accessibility to a complete stock of repair parts is an important factor in first-class service. Another one is a service truck, for many lines of business require uninterrupted service. The only way for an agent to assure his customer this is to have a service truck constantly available. A charge by the hour that will cover the actual cost of this service should be made.

The success of the motor truck dealer depends upon the service that he renders his patrons. If he has a reputation for courteous, honest dealing, his business will be given an added impetus in its progress toward success.

Fifteen Heavy-Duty United Trucks Ready to be Sent to Cantonments

Shown lined up at Grand Rapids, Michigan, previous to being sent to Cantonments. Ten of these trucks were sent to the aviation field at Rantoul, Ill., and five to Waco, Texas. They are all of either three or five tons capacity.

Opportunity comes to the well-informed. Read the CCJ

Some History of the Motor Truck

By J. CROW TAYLOR

A GROUP of coal men in one of the larger cities of the country who were gathered around a long table for discussion of subjects of interest after the regular monthly dinner meeting of the local organization, took up the subject of motor trucks in the coal business. The discussion in this case was particularly interesting as marking a decided change in sentiment having taken place in about a year's time.

I had brought up the subject of trucks in the coal business something like a year previously at a similar meeting of the coal men, and it had then received but little encouragement. It developed from the discussion that two of the local men were using some heavy trucks, but mainly for sand and gravel and only for certain heavy loads and long hauls of coal. Moreover an authority from another city ventured the opinion that the entire system of delivery would have to be changed to make trucks practical. Also he thought they were only practical in certain cities under certain conditions.

Early Users Pleased

At a more recent discussion there was an entirely different attitude. It developed that during the year a dozen or more new trucks had been put into commission varying in capacity from a converted Ford to some of the heavier 5- to 7-ton trucks. The best pleased men seemed to be those who had put in two-ton trucks, partly because two tons had been the regulation wagon load size previously, and this seemed to make the two-ton truck fit in nicely with their trade. Some had power dumps and some had beds constructed after the type of coal bed used on their wagons with hand dumps.

The expression at the later meeting pretty generally indicated a belief that the trucks would do practically all the work in the future, not only in the city in question, but there was present a visitor from another city where they had talked trucks but had not so far ventured into their use, who said he thought when he reported back home there would be more active experimenting with them.

Finally the discussion took on something of a historic nature, a reviewing of the progress of hauling from back in the days where it was delivered by the barrel in ordinary wagons, to the coming of the one-ton coal-type of wagons, then the two-ton and finally the truck.

What set me to thinking and called up some historical incidents in connection with motor trucking, reaching far back, was the change of sentiment which had taken place in this one line of trade in the course of a year's time, from doubts and questionings, to enthusiastic belief that the motor truck is the whole thing.

First I thought of a gathering of lumbermen four or five years back where I had sought to introduce the subject of motor trucks for use in the retail lumber yard for making deliveries. I had followed the matter with considerable interest for years and thought it was one which would make a good subject for discussion at the annual gathering of the state association of lumbermen.

Trucks Interested Lumbermen

When the matter was laid before the committee in charge of planning the annual gathering, however, they refused to consider the subject, classing it as impractical and untimely. Later a trip made through the state in which a number of lumbermen were interviewed brought out the fact that the lumbermen in smaller towns and at country points were actively inquiring into the subject of truck possibilities. Since that time the truck has developed until it is a very conspicuous factor in lumber yard work, and the very men who refused to have the subject a part of the program at the annual meeting are now owners and operators of trucks themselves.

This in a way has been the history of the motor truck business in practically every line of development for many years.

Back something like twenty years ago while in the process of earning my spurs in journalism I was doing technical and mechanical features for the Old Age of Steel, in St. Louis. We had up for some attention the subject of the horseless carriage, out of which was developed the automobile and the motor truck. Many of the engineering and mechanical journals on our exchange were taking up the subject from various angles, and many ideas and inventions were the subject of articles in those days.

Developed the Railroad

I was moved by these and the surroundings at that time to write a special Sunday story for the St. Louis Globe Democrat on the subject of the horseless carriage, which I believe constitutes one of the feature stories on motor subjects used in the big daily papers. In this I had gone back to those early days of steam engine development where the effort was directed toward power locomotion rather than toward power for driving machines. The first steam engines pushed themselves along the road with steam power. It is interesting to note in this connection, too, that while they were passenger vehicles there developed out of it, by mounting them on rails, the great railway systems of the world for handling freight. This point is significant because it looks as if the history is going to repeat itself in a different way and that out of the automobile idea, developed primarily for passenger vehicles and pleasure, we are to derive a freight carrying or industrial system of motor trucks that will be as big comparatively as the railway systems themselves which were developed out of the original effort at building a horseless carriage.

In winding up the Sunday story referred to I recall that comment was made upon the cumbersomeness of the steering gear of traction engines and other vehicles, and offered the suggestion that something less cumbersome would have to be developed to make the power driven road vehicles satisfactory.

Pretty soon afterward the editors and publishers of the Age and Steel called me into the office and asked me to look into a new gasoline engine being advertised by a local manufacturer. He was advertising an engine that would develop six horsepower and only weighed 90 lb. Some of the readers of the paper had been writing in to inquire about the reliability of it, to know whether it was a fake or whether it was the real thing. So they requested me to go investigate and report.

I am sorry now that I did not attach enough importance to the incident to keep a memorandum of the name and exact location. It was somewhere in the heart of St. Louis, and the maker of the new engine willingly demonstrated it to me. He had one mounted on a timber with, I believe, a brake attachment to demonstrate its pulling power. Then he had another unmounted, which I was invited to handle and lift, and I judged it to weigh not appreciably more than 90 lb.

The First Light-Weight Engine

Of course we can look back now and think of this with a smile because we can see that 6 horsepower multiplied several times today in engines not weighing more than 90 lb. But at that time it was an achievement that taxed the credulity of the public almost as much as if a man had announced that he had a machine that would fly. Moreover, it was one of the important steps which marked the successful introduction of the automobile.

There was another one of the important steps found at the same time. After demonstrating the engine, this inventor took me outside where he had constructed a buggy-like vehicle, where instead of the entire front axle swinging to steer or guide it, each of the front wheels was pivoted, the axle remaining rigid. These wheels were pivoted and hitched up pretty much like the standard steering gear of an automobile or motor truck of today, and if not the forerunner of all modern steering, it was at least the first of this type I had encountered. Time has proven, too, that he had the right idea, the idea I had guessed at and mentioned in the Sunday story for the Globe Democrat. What we needed then, and what we developed later to make the automobile and commercial vehicle a success, was light weight engines and a less cumbersome steering gear.

From that time to this there have always been two problems before the motor industry. One, that of solving the mechanical questions involved, and the other, overcoming prejudice and convincing the public

of the possibilities of power driven vehicles. Unbelief and having to be shown is one of the most persistent characteristics of the public mind, and it is with us in different form today, just as it was with us twenty years ago, when the pioneers of the industry here were bringing out their most important inventions.

For example, many people are just now awakening to the fact that efficiency in using the motor truck does not necessarily depend upon tonnage and keeping it employed steadily.

One of the serious handicaps about selling motor trucks in some lines of industry has been the fact that as soon as a man gets to thinking about motor trucks he gets to figuring on how much tonnage he has to haul and whether or not he has enough to keep a truck busy so that it will yield a full measure of return on his investment.

Things of this kind are encountered especially in various branches of the wood working industry, among furniture manufacturers, flooring manufacturers and the makers of handles, wood specialties and other manufactured articles calling for some hauling to railway depots, hauling for local delivery, etc., all of which requires wagons and teams, but does not always require steady work like some other branches of the industry.

Box factories and cooperage plants may often figure a tonnage that will keep the truck employed, whereas the demand in some other lines will not have any great tonnage compared to these. So the man in other lines is likely to say right off the reel that he doesn't think the truck practical in his case.

This argument was punctured in the rounds by a manufacturer of parquetry flooring who has been using a truck for four or five years, and expresses the opinion that any man who has more hauling to do than can be taken care of with a one-horse wagon can afford a truck. He points out that if the truck is not employed steadily it is not wearing out as fast, consequently the depreciation charge is less. Moreover, when it is standing idle it is costing nothing.

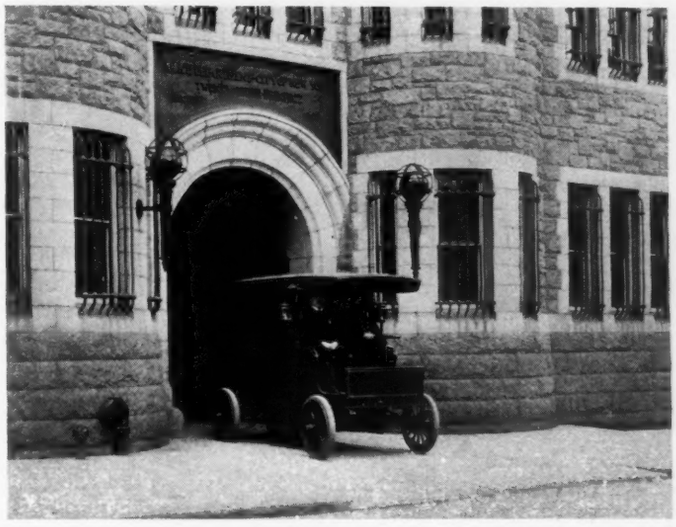
In short, his experience goes to prove that the matter of efficiency practically balances itself regardless of tonnage, and that many people have been misled on the theory that when they buy a truck they must keep it employed all the time to make it yield returns.

This, then, is the problem of today among truck salesmen in many lines. To convince those requiring only a limited service and light sizes in trucks that the motor truck will give a good account of itself there just as well as where the tonnage is heavy and the duty arduous.

New York's First Auto Patrol is Still in Active Service

By GEORGE W. GRUPP

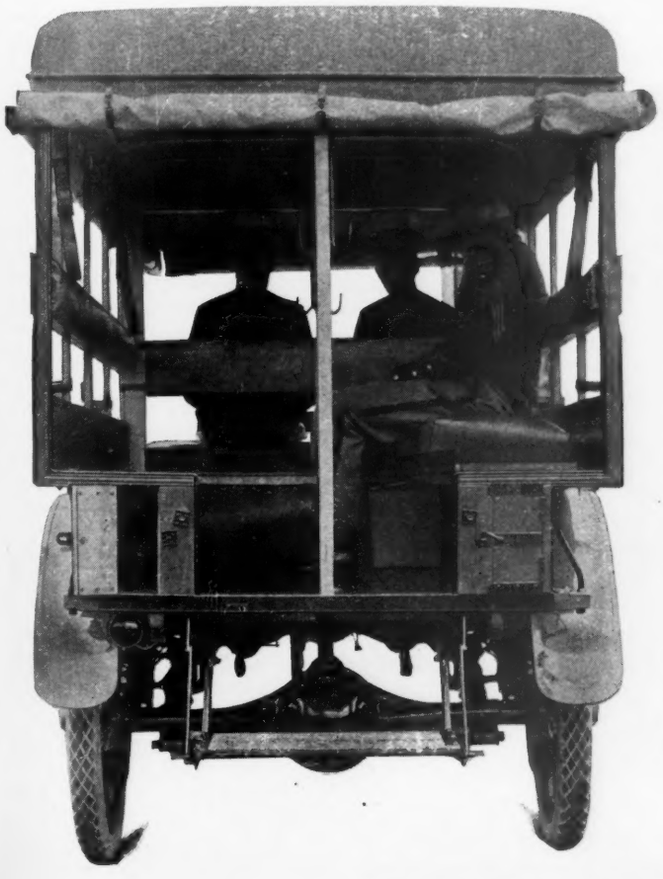
It is interesting to note that the first auto patrol used in New York City is still giving satisfactory service. This G. V. truck was bought by the city in 1907 for the twenty-third precinct. Since then, of course, a great many others have been added until today New York may rightly boast of having the largest fleet of electric police patrols in this country. These patrols are stationed at the 13th, Clinton, 5th and 20th precincts. The old electric has been lately transferred to the Greenwich Street precinct.



In Police Service for Ten Years

The first motor patrol on the New York Police force. This G. V., which was bought in 1907, is still doing active service.

In spite of this truck doing ten years' service it is as noiseless as a new machine. It covers from 50 to 75 miles a day and sometimes as high as 110 to 115 miles. To operate this machine it costs the city only 7½ cents a mile. This was the first vehicle to arrive on the scene of the famous Triangle Shirt Factory fire, in 1911, in which fire over one hundred lives were lost.



Ambulance Body on King Chassis

The King Motor Car Company, Detroit, Mich., is placing its standard eight-cylinder King chassis under the bodies that will be used by the ambulance corps of the United States Marine Corps. This arm of the Government service is also using the eight-cylinder King chassis under their light-armored motor cars, and in using them under their ambulances are able to standardize in case of needing parts.

The bodies have medicine chests, two water tanks, receptacles for bandages, and other necessities used for the care of the sick or wounded on the battlefield.

THE CITY COUNCIL OF DETROIT may limit the size and use of heavy duty trucks and trailers and possibly increase the width of steel tires.

THE NEW YORK STREET CLEANING DEPARTMENT recently purchased 12 immense motor-driven street flushers, which with tank filled weigh 15 tons. The tanks hold 1800 gallons of water.

BURLINGTON MOTOR TRUCK CO., Burlington, Wis., organized at $50,000, has leased manufacturing quarters and will build 600 commercial car units for attachment to Ford chassis by January 1st of next year.

GENERAL MOTORS CO., Detroit, will build a forge shop requiring nine 10 to 15-ton electric traveling cranes and other shop equipment.

All phases of the truck industry covered best in the CCJ

Using Motor Trucks for Long Hauls*

Have you noticed a typical freight yard recently, with its dozens of loaded cars awaiting shipment?—because, if you have, you'll no doubt appreciate more readily why many concerns are having to reorganize their delivery methods somewhat like the concern described in this article.

TWO motor trucks have eliminated a branch establishment, a branch manager, a bookkeeper, a plant foreman, two horse-drawn wagons, and two drivers for a provision company in Cleveland—all at a cost barely equal to previous charges for freight and drayage alone. The motor trucks are also increasing sales through giving prompter service, as well as cutting costs, on business that was formerly handled over the railroads.

To the west of Cleveland, 26 and 30 miles respectively from the company plant, lie the two thriving centers of Elyria and Lorain. Along the roads leading to each town are smaller suburban localities not to be overlooked as desirable markets. Originally the provision company had a branch house with cold storage equipment at Lorain, manned by the force of five employees enumerated.

To supply the needs of this station a freight car was routed each day to Lorain by way of Elyria, the shipment being made up partly of goods to fill orders, and partly for stock. The car arrived at Elyria, under normal schedule, on the day after packing. There it was uncoupled and Elyria shipments were removed. On the second day after packing, if all went well, it reached Lorain. There the remaining goods were unloaded, transferred to a wagon, and hauled to the branch house for storage or distribution. Orders could not be delivered to the customer's place of business until at least the third day after the car was packed.

Truck Solves the Problem

This delay was costly in two ways. Because the provision business is highly sensitive to weather and other conditions, it is difficult to forecast demand. For this reason the branch was not infrequently overstocked on individual lines, with the consequent danger of loss through deterioration. Reduced prices as an inducement to move excess stock were not unusual. Also, there was a continual danger of complaints from the customer because the goods were three days "on the road" to him. From both angles conditions were highly unsatisfactory to the company when they decided to employ motor trucks to develop and handle this desirable suburban and small town trade.

The present plan presents some graphic and profitable contrast. Of the former force at Lorain only the two salesmen remain. One is stationed there, the other has his headquarters at Elyria. Each covers his town and way-station toward Cleveland during the day, and mails in his order *special delivery* in time to reach the Cleveland plant in the early evening.

Each order is numbered serially by the salesman in the order that it should be delivered. The truck-packer then packs the truck in reverse order, so that the driver need waste no time in locating the next delivery. In other words, the salesman routes the truck among his customers each trip in the order which he, from his familiarity with the locality, knows will save time and mileage. The packer observes his instructions, and the driver has merely to follow these exact directions in covering his route.

The orders received in the early evening are packed in the early morning hours, and the truck leaves the home plant at six in the morning. A three-ton truck operates daily over the route to Lorain, delivering at intermediate points also. The Elyria route is covered every other day by a 3-ton or a 1½-ton machine, depending on the bulk of the orders on hand (goods are no longer shipped for "stock"). If the 1½-ton truck makes the trip the three-ton truck is employed on city hauling. The monthly average mileage of the Lorain truck is in the neighborhood of 1,700 miles.

While the solution of the company's Elyria-Lorain problem, because of the abandonment of the branch station, represents the greatest saving through using motor trucks, the company operates two other notable routes which are interesting—in one case because of the number of communities served, and in the other because of the greater length of haul.

Freight Deliveries Slow

On alternate days a truck operates from Cleveland directly east through Wickliffe, Willoughby, West Mentor, and Mentor, to Painesville, 29 miles out. On three days a week also a similar service covers a 90-mile route reaching Twinsburg, Hudson, Cuyahoga Falls, Kent and Ravenna—the last named is some 39 miles south of Cleveland.

The Painesville route illustrates the difficulty of freight shipments. In that territory the company had the alternative of paying a flat charge of $5 for each way-station stopover, or of paying freight on the full carload to the farthest point. In either instance, freight service was necessarily slow.

To summarize briefly the many advantages which this company feels that it derives from motor truck delivery to towns nearby:

(1) The trucks operate at a cost no greater than the sum of the freight costs and drayage charges of the earlier system. The previous overhead expense of the branch station, made up of five salaries, rent, upkeep, supplies, and depreciation, is now a total saving of no inconsiderable size.

(2) All goods now reach the customer absolutely fresh, always on the same day that they leave the plant. Over half of the orders are delivered the day after they are placed. These two facts are naturally proving powerful sales arguments, immediately apparent in results.

(3) The company is practically free from costly delays, their resultant complaints from customers, and claims against the railroads for depreciation—expensive in the time they formerly consumed for the office departments. With truck delivery the whole transaction is personal, from the time that the salesman enters the order to the minute that the truck driver, the company's representative, unloads the goods at the customer's place of business. All the many chances for misunderstandings, mistakes, and delays which developed under the old system—where both a railroad company and a drayman handled the goods in shipment—are now eliminated.

(4) Perhaps the most graphic result of the new policy, however, is the fact that the company's sales charts show that the cost of selling and delivery in the Lorain-Elyria territory has been cut one-half. All the other advantages may therefore be fairly regarded as "velvet."

*Reprinted from the September, 1917, issue of *System*.

New Style Dumping Body Being Used in Great Britain

The latest style of British dumping truck has a two-compartment body. The hinges on either of the compartment flaps are worked separately by a lever. The crank of the hand-worked tipping gear can be seen in position at the side. For ease in loading, the side tops can be dropped.

Advertising in the CCJ is memory insurance. "Out of sight, out of mind," you know

CHILTON TRACTOR INDEX

Published by CHILTON COMPANY, Philada., Pa.

What you ought to know about tractors, their parts and accessories.

The Chilton Tractor Index will make its appearance shortly after the first of the year.

$1.00 a Copy. Order now

Chilton Company
Market & 49th Streets
Philadelphia, Pa.

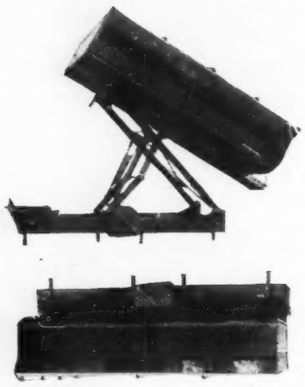
Woonsocket Offers Elevating and Dumping Bodies

A well built dumping body with a hoist has been recently designed by the Woonsocket Wagon Mfg. Co., 2-38 Worrall St., Woonsocket, R. I. It is steel throughout with rounded bottom corners. With the hoist either a plain dumping or a rear elevating position can be had. The plain dumping position gives an inclined plane of 50 deg. and the other position gives a 3-ft. elevation and an inclination of 30 deg.

In changing the operation of the body from rear elevating to rear dumping, a cable at the front end of the body is released. There are said to be no pins or other loose parts to lose. The gears are crucible steel and together with the worm are enclosed in a grease-tight case. The worm gear is said to prevent the body from running down until desired. The lifting arms are steel hand forgings and the long arms are 4-in. Carnegie Channel steel.

The tailboard has a scuttle door and a chain for bag coal carrying. The top tailboard is removable. The body can be arranged for either hand or power operation. When power is used, a special reversing mechanism is furnished, which includes a separate small transmission that is placed in any position to drive from any suitable power attachment that the truck may have.

The body can be used on trucks of from 1- to 7½-ton capacities. Mounting on chassis requires about two hours.



Two Views of the Woonsocket Body

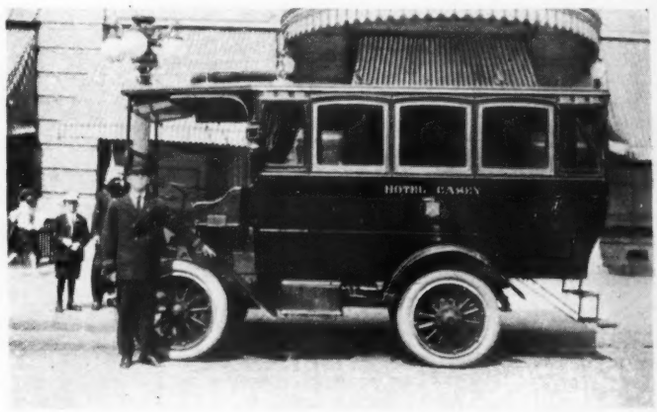
Above, the body is in the rear elevated dumping position, giving an inclined plane of thirty degrees. Below, the body is shown in its normal position.

Double Use of Trucks

Casey Brothers, Scranton, Pa., proprietors of the Hotel Casey and of a wholesale liquor store, have recently made over into a service truck, an autobus which had lived its life in that capacity. The truck is a 2-ton Autocar. It was bought with a closed body with windows, the familiar type of hotel depot bus, and was made over by the head chauffeur and a mechanic. It now does general work and is giving good service on the steep grades in the city.

The firm uses two new Autocar buses which operate between the Hotel Casey and the depots of the Erie, Lackawanna, D. & H. and Central Railroads, the Laurel line, and occasionally, an interurban electric line.

The wholesale business of the firm uses a power hoist dump truck, a heavy Mack for city delivery, a 1-ton Reo and a Ford with delivery bodies. Deliveries are made throughout the city, and as far away as Carbondale, Wilkes-Barre and Dalton, respectively distant, in different directions, 18 18, and 12 miles.



The Autocar Depot 'Bus of the Hotel Casey, Scranton, Pa.

Universal Joints on 'Buses

A while ago a good deal of discussion and surmise was aroused in America by the statement in an S. A. E. paper that the London bus companies had not found the flexible leather ring joint satisfactory for their propeller shafts, and had replaced them by the older fashioned universal joint.

The reason for this was not fully given at the time, but since then it has been learned that it was found more particularly with light loads that the leather joints would not stand up to working at the more acute angles that resulted from running the car entirely light. The result was that, though the joints showed no sign of distress with occasional light running, constant work under these conditions made the leather tear, and even with a thin sheet of spring steel introduced between the layers of leather, this tearing still took place.

With Hardy's fabric of canvas and rubber it was found that the material stretched and the consequent play led to a regular "lumping" on the propeller shaft, which sometimes had serious results

On the other hand when vehicles are constantly laden, or the frame is weighed down until a fairly favorable angle for the propeller shaft is reached, the flexible leather joints stand up admirably and more than one firm of users has absolutely refused to replace their leathers by knuckle joints, in spite of all the persuasions of the makers.

Interesting Special Form of Industrial Truck for Hauling Building Material

The illustration shows a rig recently placed on the market, which possesses small size, simplicity and speed of operation.

The motive unit is an electric-driven industrial truck of two tons capacity, similar to those commonly used in warehouses and railroad stations, for handling trunks, boxes, etc. Upon this truck is mounted a Lee side-dumping hopper of 1½ yd. capacity.

Overall dimensions of the complete machine are: length, 8 ft.; width, 4 ft.; height, 4 ft. Hoppers, dumping off the end of the truck, are also manufactured. Both outfits are sold by the Buda Company, Railway Exchange Building, Chicago, Ill.

N. A. C. C. to Eliminate Cut-Out

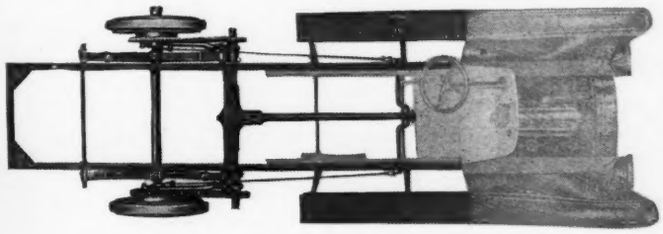
The members of the N. A. C. C. at a recent meeting declared the muffler cut-out a nuisance and unanimously voted for its elimination on the cars they build in the future. This concerns the cut-out so far as it can be operated from the driver's partments will be conducted. He will be the Chamber do not fit the muffler cut-outs to their present cars and all makers voted that they should be eliminated in the new products. Cars have ample power so that the slight increase in speed which may come from the use of the cut-out is of no importance. There may be times in adjusting the engine where a cut-out is useful, but in such cases it may be operated from under the car.

Why is the CCJ the only truck paper a member of the Audit Bureau of Circulations? Here's food for thought

Metz One-Ton Truck Rear-End and Front-End Attachments

Two rear-end truck unit attachments and a front-end truck power unit are being manufactured by the Metz Co., Waltham, Mass. The only essential difference between the two rear-end units is that one has a chain drive and the other an internal gear drive.

The chain drive unit sells for $350, f.o.b. Waltham. It has a 5-in. channel steel frame, 168 in. long and 32 in. wide. The axle is 2½ in. and has solid, durable roller bearings. Two semi-elliptic side springs, 2½ in. wide, having ten leaves, take the road and load shocks. Heavy artillery wheels of twelve 2-in. spokes each and equipped with 32 x 3½-in. pressed-on Goodrich tires increase the load capacity and durability of the unit. The rollers of the chain are ¾ in. diam., ¾ in. wide and have a 1¼-in. pitch. The speed rate of the unit is 15 m.p.h. with a gear ratio of 40:18. The loading space in back of the seat depends on the type of body used. When attached to the Ford chassis the wheelbase is 125 in. and the tread is 56 in. The weight of the unit is about 1000 lb.



A Plan View of the One-Ton Truck Attachment offered by the Metz Company

The Front-End Power Plant

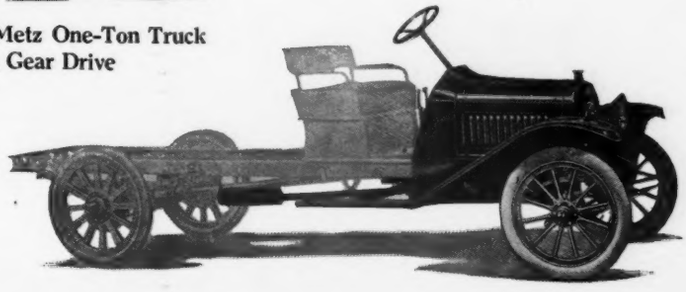
The Metz Co. is also offering a front-end power plant for $500, f.o.b. factory. It has a Metz 25 h.p., 4-cylinder, water-cooled engine, the cylinders of which are cast en-bloc, with ample water jackets and valve chambers. The steel crankshaft is supported on three main bearings of liberal dimensions. All the valves are mechanically operated and interchangeable. An effectively lubricated camshaft is enclosed within the crankcase. Inlet and exhaust valves are on the right side of the cylinders.

The upper half of the crankcase is carried on two steel channel sections, bolted to the main frame. The bottom section is an oil well and can be easily removed for inspection. The splash system of lubrication is used of which a constant level and an overhead distributing reservoir are features. An A. W. T. carburetor with a float feed and automatic regulation for engine speeds is used. The ignition is obtained through the Atwater-Kent system together with a Westinghouse generator and a Willard storage battery. The engine is started by a Westinghouse starting motor equipped with a Bendix pinion.

A Westinghouse generator with an automatic regulator that retains a reserve voltage is used in supplying current for the lighting system. The two front wheels are 31 x 3½ in. with Goodrich tires. A standard three-speed selective type transmission in unit with the motor is supplied with a left hand drive and center control.

A 2-ton or more truck attachment, selling for $400, is also offered together with the above units. It is of heavier construction to sustain the added weight and has an approximate weight of 1300 lb.

A Side View of the Metz One-Ton Truck Attachment, Gear Drive



The Metz Front-End Power Plant Unit Attached

The Ashland Ratchet Jack

The Ashland Products Co., Ashland, O., is producing a ratchet jack controlled by a handle and a small reverse member. This jack obviates the necessity of getting under the car to operate the jack or to change the direction that the load is to go.

To raise a load the handle shown above is placed in the socket with the word "Up" on the upper part of the handle. The load is then raised by moving the handle up and down. To lower a load the same operations are repeated when the handle is inserted with the word "Down" uppermost. There are no springs or other unnecessary devices to hold the handle in the socket. The jack is said to be foolproof and the handle has a lug on it to prevent its insertion from damaging any of the smaller parts of the jack. There are seven parts combined to make the ratchet jack complete and it occupies a small space in the tool box.

The Ashland Ratchet Jack and Handle

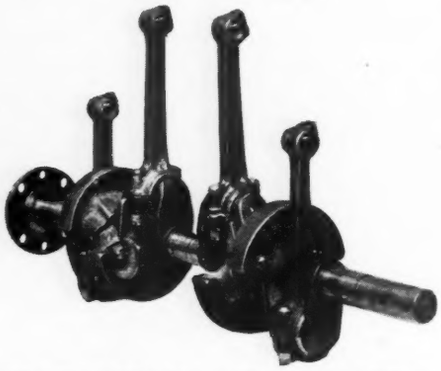
This ratchet jack also has an instant release attachment in the form of a small button and by pressing this through the side of the stand or housing the pawls are disengaged, allowing the rack to drop.

BUDA Co., Harvey, Ill., is offering $1,000,000 7 per cent. cumulative preferred stock for sale. This company manufactures motor truck engines and other equipment.

Dunn Counterbalancing Attachment for Ford Crankshaft

Counterbalancing weights for the Ford crankshaft, designed to absorb excess vibrations and produce smoother running at high speeds, are being produced by the Dunn Counterbalance Co., Clarinda, Iowa. Since the original Ford crankshaft was not designed to take counterbalances, the Dunn weights must be attached to the oblique arm connecting the crank pins instead of to the crank arms nearest the main bearings.

When attached in this position the same results are declared to be obtained because the counterweights set up centrifugal forces in opposition to those produced by the original shaft. Besides eliminating friction in the bearings, counterbalances are said to automatically annul the loss between power impulses and to offset the driving force conducted to the piston, and thence to all parts of the engine.



The Dunn Weights as They Appear When Attached to the Ford Crankshaft

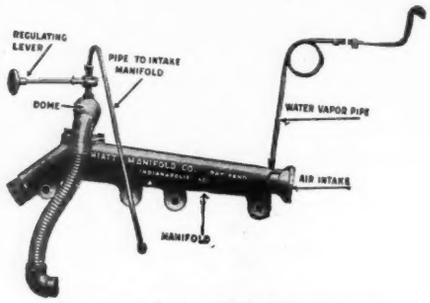
When the mixture explodes in the cylinder, a sudden blow is transmitted to the reciprocating parts, the crankshaft springs ahead, and, as there is nothing to hold or neutralize this force, it tends to spring back again. This causes vibration, or wasted energy. Excessive energy is wasted continually while the motor is in operation. When the crankshaft is properly counterbalanced this wasted energy is arrested and turned into reserve power, the force of the explosion is absorbed and neutralized without taking away its driving effect, and destructive, power-absorbing vibration is practically ended.

The Dunn counterbalancing weight can be attached to the crankshaft without dismantling or altering the engine. A socket wrench is the only tool required. A complete set of weights retails for $12.50.

The Hiatt Manifold for Fords

The Hiatt Manifold Co., Indianapolis, Ind., is marketing a manifold, for Fords only, for which more mileage and a smoother running engine are claimed.

It replaces the one on the Ford car and differs from the latter in that it has a hollow pipe on the inside of the body. This pipe conveys air from the outside which combines with the water vapor coming from the radiator through a small copper pipe. This mixture is superheated in passing through the pipe by exhaust gases around the internal pipe. Upon collecting in the dome, this superheated, vapor-laden air becomes a gas which combines with the fuel gas to produce a readily exploded mixture.

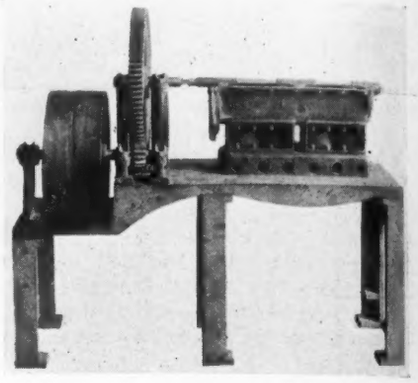


The Hiatt Manifold Attachment

The Hiatt manifold is sold complete for $15, with all minor attachments for fitting to a Ford engine, complete directions, etc.

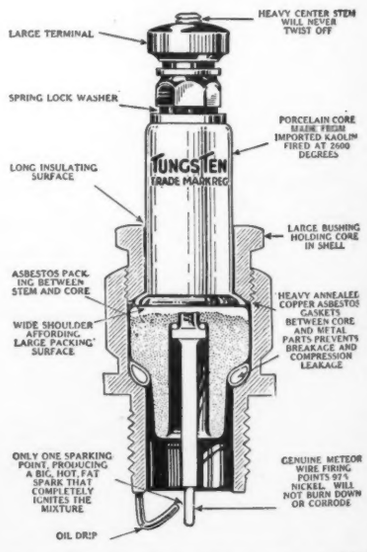
Engine Stand for Fords

By using this stand all the bearings on the engine can be fitted in one operation. The engine can also be assembled on the stand and worked in before it is put on the car. An extra bracket that bolts to the side of the stand allows the engine to be turned to any position, for valve grinding, placing the head plate, or for bolting the crankcase to the transmission if the crankcase is removed from the car. This bracket costs $16.40 extra.



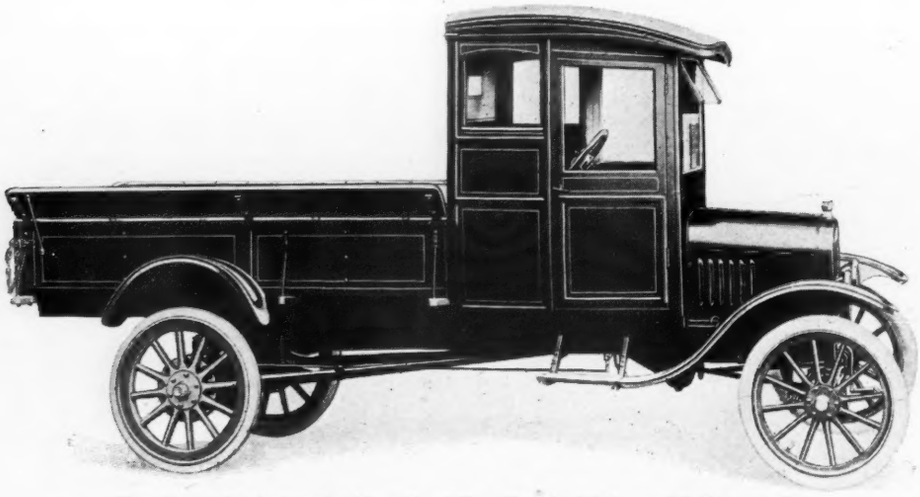
The Goodale Stand With an Engine in Place

Either a reamer for the main bearings alone or one that does the same work and also fits all connecting-rod bearings at one time, if the pistons are left in the cylinders, can be had. This makes possible the truing of all bearings at the same time. The Goodale Motor Stand Co., Iola, Kansas, is marketing this stand for $76.50, f.o.b. factory.


HEAVY CENTER STEM WILL NEVER TWIST OFF
LARGE TERMINAL
SPRING LOCK WASHER
PORCELAIN CORE MADE FROM IMPORTED KAOLIN FIRED AT 2600 DEGREES
TUNGSTEN TRADE MARK REG
LONG INSULATING SURFACE
LARGE BUSHING HOLDING CORE IN SHELL
ASBESTOS PACKING BETWEEN STEM AND CORE
HEAVY ANNEALED COPPER ASBESTOS GASKETS BETWEEN CORE AND METAL PARTS PREVENTS BREAKAGE AND COMPRESSION LEAKAGE
WIDE SHOULDER AFFORDING LARGE PACKING SURFACE
ONLY ONE SPARKING POINT, PRODUCING A BIG, HOT, FAT SPARK THAT COMPLETELY IGNITES THE MIXTURE
GENUINE METEOR WIRE FIRING POINTS 97% NICKEL. WILL NOT BURN DOWN OR CORRODE
OIL DRIP

The Tungsten Extra Heavy Spark Plug

A spark plug of extra heavy construction is being marketed by the Tungsten Manufacturing Company, Marshalltown, Iowa. It is composed of a heavy shell and bushing, a large porcelain insulator, a heavy central electrode, copper and asbestos washers and gaskets, a spring lock washer, a brass ring, a large tightening nut and a terminal cap. The firing point is kept clear of oil by its position and the shape of the ends of the electrodes. The Tungsten plug is made in different sizes and types for different engines. It is guaranteed against defects in material or workmanship and is claimed to give a fat, hot spark under all conditions.



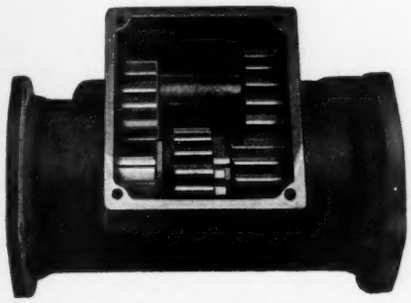
The Parry Body for the New Ford Ton Truck, With an All-Season Cab

A line of bodies suitable for the new Ford truck is being manufactured by the Parry Manufacturing Company, Indianapolis, Ind. Above is shown the No. 610 express body together with the No. 52 all-season cab. The body is sturdily constructed and well ironed. If extra ventilation is desired in the cab, the pins are removed from the hinges and the right door taken off. There are hinged windows on each side of the cab and a curtain in the rear.

The CCJ is built upon the lasting foundation of honest circulation

"2-in-1" Model Woodward Transmission for Fords

A reversible transmission for Ford cars, giving either overdrive or underdrive gear ratios, has been developed and is now marketed to the trade in addition to the original Woodward four-speeds for Fords. The new "2-in-1" model is manufactured for mounting in the forward position, which can be reached by removing the floor



"2-in-1" Model Woodward Transmission
Opening this gear box requires the removal of only four bolts

boards. The gear shift lever runs direct to the gear box. The construction practically gives two transmissions in one, as it can be changed from overdrive to underdrive, or vice versa, by simply unbolting and reversing the gearcase. The underdrive assembly gives all drives under high, with direct on high, and the following gear ratios: Low, 15 to 1; second, 10 to 1; third, 5 1-6 to 1; high, 3 7-11 to 1; direct drive on high. When the overdrive combination is wanted, the transmission is unbolted, reversed and bolted in again. The overdrive

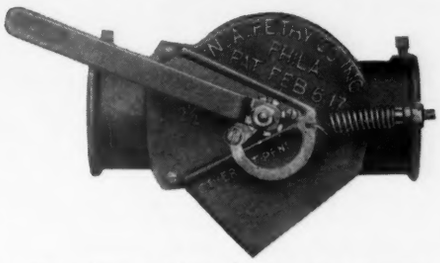
Appearance of the Transmission Applied
Accessibility through the floorboards facilitates lubrication and inspection of gears

position gives the following gear ratios: High, 2 2-11 to 1; third, 3 7-11 to 1, direct drive on third; second, 6 to 1; low, 10 to 1. It is apparent that the overdrive position gives extra high speed for touring cars or lightly loaded commercial vehicles. The underdrive gives a very effective low speed ratio for commercial work and heavy touring, such as a transcontinental trip. The reversibility enables a man to get full advantages of either drive by using a single 4-speed transmission. The underdrive has proven especially effective in commercial work, also in camp touring, where heavy loads, and sometimes a trailer in addition must be carried through all kinds of country. Mud and sand conditions also favor satisfactory performance of cars equipped with this transmission.

This front end transmission for Fords does not displace the Woodward rear end, four-speeds for Fords, but is marketed as an addition to the line. The price is $60 f.o.b. Los Angeles, and the Woodward Truck Attachment Co., Los Angeles, Cal., is the maker.

A Special Petry Cut-Out

The N. A. Petry Co., Inc., 1309 Race St., Philadelphia, Pa., is manufacturing a cut-out designed to comply with government specifications. These specifications include a gas-tight, non-fluttering valve, a control



The Petry Cut-Out, Designed to Comply With Government Specifications

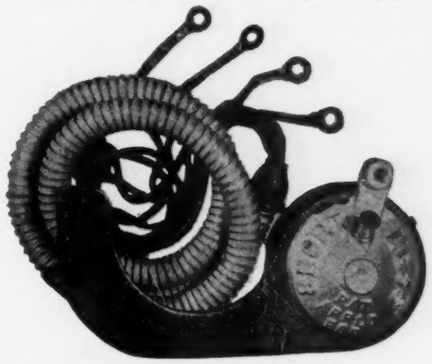
lever operated by hand and the cut-out being used to tune up the engine.

The valve lever of the special Petry cut-out can be adjusted to seven different positions and the leverage afforded makes operation easy. The valve remains in the position desired—either open or closed. The flared opening of the cut-out intensifies the sound, so that it is possible to distinguish between the different exhausts, from the various cylinders while the engine is running at low speed.

THE O'NEILL MFG. CO., Detroit, manufacturer of truck, cab and delivery bodies, is about to begin the erection of a larger factory.

The Shortless Timer for Fords

A timer designed to replace the one already on the Ford model T car is being made by the American Automobile Accessories Co., 2776 Francis Place, Chicago, Ill.



This Shortless Timer Replaces the One Furnished With the Ford Car

The wires are well insulated and are so arranged that confusion is eliminated. Effective connections are made possible by the absence of binding posts.

The Shortless timer is made in two parts —the insulating block and the wire cable being one unit, while the commutator ring is made separate and can be replaced without touching the wires. This ring is strong and durable and retails for 75 cents. The only connections necessary to make in attaching the timer are those on the dash terminals. The price of the timer complete with all necessary wiring is $5.

THE MUNICIPAL COUNCIL of the City of Paris has placed orders for $2,260,000 worth of trucks—100 Fiat 3½-ton and 100 Pierce-Arrow 5-ton trucks and $620,000 on spare parts. These trucks are to be used in the distribution of coal, flour and general foodstuffs in Paris and surrounding territory during the coming winter. The trucks will be under the entire control of the city and all drivers and mechanics will be in the pay of the city. Special garages are being erected.

The Egan Device Carried on a Wrecking Car to Help Bring in Disabled Machines

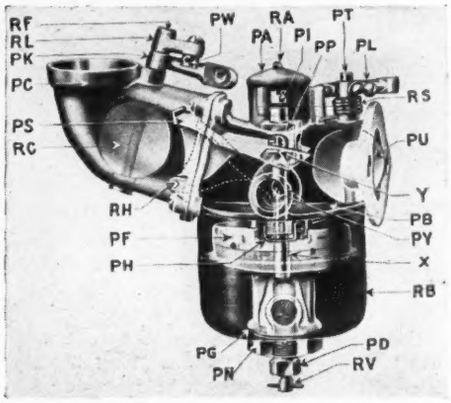
A device designed to handle wrecked automobiles and convey them to the place where permanent repairs can be made, is being marketed by the Egan Wrecking Truck Company, First National Bank Building, Chicago, Ill. It can be attached to any service automobile and one man is said to be able to bring a wrecked car into the shop in a short time. When attached to the service car the device does not interfere with the use of the car for other purposes. When not in use it can be used as a hoisting apparatus in the shop.

It consists of a hoisting attachment, a set of auxiliary axles with wheels, and an automatic drawbar and steering device that makes towing easy. The wrecked car is towed three feet behind the service car, and collisions, slacking and tow-rope breaking is avoided. When stored the device entire occupies a space 76 x 60 in. Above is shown the apparatus on a wrecking car of the Egan Company.

Make your product pay—advertise in the CCJ

New Dave Buick Carburetor

In this carburetor the fuel enters the bowl RB through the usual type of valve PV, controlled by a float PF, which maintains a constant level of fuel in the bowl. The fuel passes from the bowl through the screen shown in the illustration into a cylinder in the center of the bowl. In this cylinder, free to move up and down, is a hollow piston PP, having a hook-shaped head, that hangs on the end of the shutter PS. This shutter turns on a shaft RH and when occupying the position shown in the illustration, the passage through the



The Dave Buick Carburetor, Showing the Construction Features in Phantom

carburetor is wide open. When in the position shown by the dotted lines, the passage is closed except for an opening in the end of the shutter and in the head of the piston. At the slowest motor speed, as when running idle, the shutter is in the latter position.

The fuel is then drawn up from the hollow inside of the piston through the jet Y, and is mixed with the air that is passing this jet. The opening of the jet is controlled by a screw, the head of which is indicated at PI. As the engine speed is increased by opening the throttle PU, the shutter is raised by the increased speed of the incoming air, and this raises the piston. The piston has, on its side nearest the throttle, a flattened face X, and as the piston is raised a small opening is made between this flattened face and the cylinder in which the piston travels, through which additional fuel is drawn out. This flattening of the piston increases toward the bottom so that as the piston is lifted by an increasing engine speed, larger fuel opening is provided.

The operation of the instrument is automatic—there is no connection between the throttle and the shutter and piston, the latter parts being operated by the current of air drawn into the cylinders.

The graduation of the flattened face of the piston is pre-determined and does not require adjustment. The only adjustment required is of the idle jet by the idle screw PI.

The Dave Buick carburetor is manufactured by the Jackson Carburetor Co., Jackson, Mich., in styles to fit all cars, from the Ford to the big multi-cylinder types.

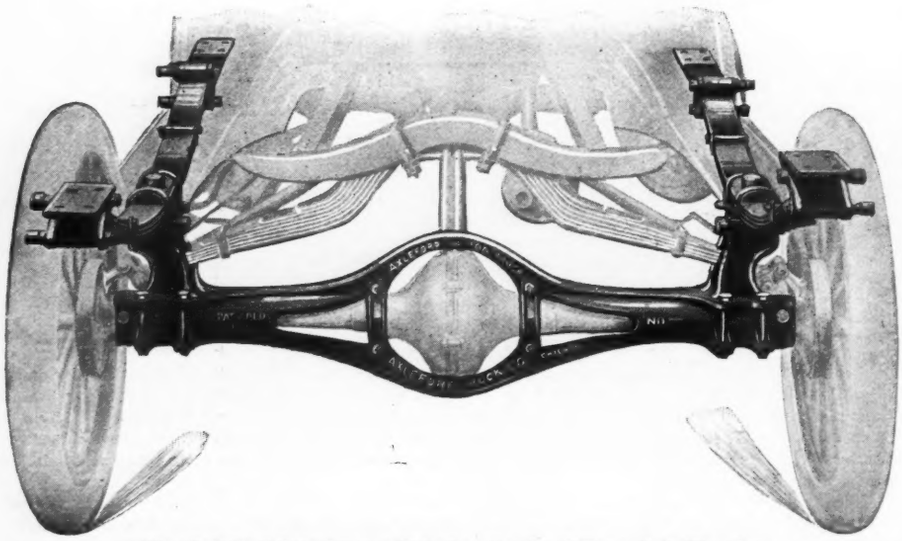
Axleford Truck Attachment

A new Ford attachment, known as the Axleford ¾-ton truck attachment, is being manufactured by the Axleford Truck Co., 4074 Broadway, Chicago, Ill.

The Axleford load-carrier is a heat-treated electric steel reinforcement for the Ford rear-axle housing. It attaches directly to and virtually becomes a part of the rear axle. It does not attach to the drive shaft, and the gear ratio remains the same as in the original Ford, so that the regular engine speed delivers the Ford mileage per hour. Attachment is made quickly and easily without changing any mechanical part or adjustment of the Ford car and the device is particularly valuable for quick delivery and light trucking.

Spring supports are integral with the Axleford load-carrier and the load is evenly balanced and carried out to the ends of the axle. Springs are mounted on large diameter case-hardened pivot-bolts to overcome excess wear and prevent the bending of the drive shaft under a heavy load. The spring shackles are drop forgings, and special oil-tempered springs 2½ in. wide are used. The spring brackets are crucible steel of large area for substantial attachment to the body sills. All bearings and spring-eyes are bushed and grease cups are integral with the bolts.

The Axleford ¾-ton truck attachment is sold by the Axleford Truck Co. for $87.50, f.o.b. Chicago.



The Axleford Attachment Fitted to the Ford Rear-Axle Housing

Pittsfield Offers an Airplane Type Spark Plug

On account of the high compression in the airplane engines and because they operate on open throttle most of the time, causing the development of excessive heat, the spark plugs used must be of special construction. An airplane type spark plug brought out by the Pittsfield Spark Coil Co., Pittsfield, Mass. of suitable construction has just been

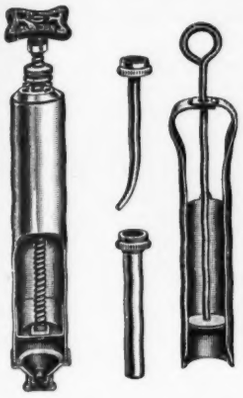
The core C of this plug is mica, with square shoulders. Two gasket seats are afforded by the square shoulders so that accurate centering and a tight joint are obtained when the core is clamped in the shell by the check nut E. Heat radiation through the stem is improved by making the plug short. A baffle plate O at the lower end of the mica. This baffle plate is perforated to the shell tends to keep the oil away from prevent the pre-ignition of the new charge, due to the pocketing of the burnt gases behind the baffle plate. The construction also brings the firing point out into the firing chamber, at the same time retaining the advantages of the closed-end type.

The Pittsfield Airplane-Type Spark Plug, Showing Finned Section and Spark Gap.

The stem is brass or copper for greatest heat conduction and the central electrode is swedged into the bottom of the stem to secure it. A large heat radiating surface is obtained by finning the shell. The possibility of leakage past the threads on the stem is reduced by riveting the stem into the top of the finned part, which is slightly countersunk. A slip terminal may be used through a neck in the upper part of the finned section.

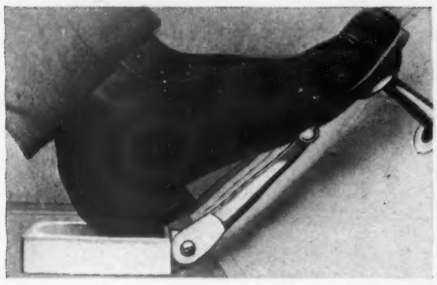
This plug can be obtained with or without the finned part, as desired. The advantages claimed for the plug are simplicity of construction, positive clamping said to provide a gas-tight connection, durability and economy.

The Audit Bureau of Circulations means Circulation Facts—not Unverified Claims.



Improved Combination Oil and Grease Gun

The Randall-Faichney Company, Incorporated, 76 Atherton Street, Boston, Mass., announces a new 1918 model combination oil and grease gun. The barrel of the new model is heavy, seamless brass tubing, polished and lacquered. By spinning a bayonet-catch nut the gun is converted from an oil to a grease gun, or vice versa. The brass piston is lapped to fit tightly and prevent leakage. The piston rod, carrying a square-cut thread, forces the lubricant with ease and speed. The square wheel grip affords a firm handhold when the fingers are greasy. Three sizes are made, 6, 9 and 12 oz. The prices are $4.50, $5 and $5.50 respectively.



The Continental Throttle Foot Rest

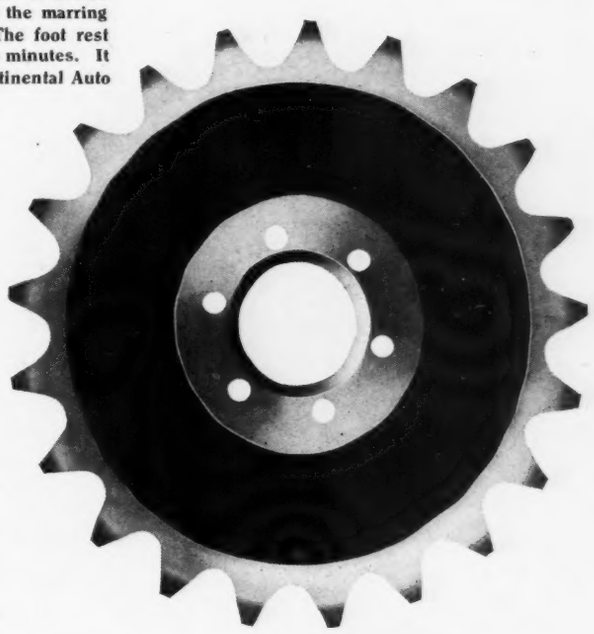
This foot rest is adaptable to any car and adjustable to any position of the foot. It enables the driver to hold the foot throttle steadier over all kinds of road, rough and smooth. It avoids tiring and cramping of the foot and the marring of the floorboards by the heel. The foot rest can be attached and adjusted in five minutes. It is being offered for $1 by the Continental Auto Parts Company, Knightstown, Md.

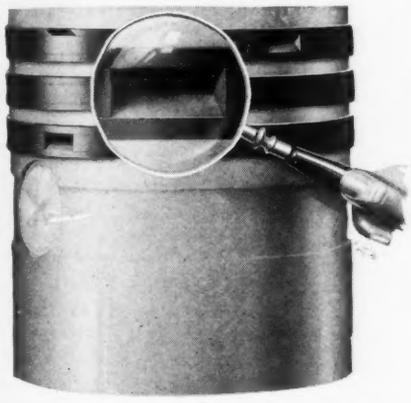
Welded Steel Blocking

The G. H. Dyer Company, Cambridge, Mass., is offering welded steel blocking for use in repairing cars. It eliminates wooden blocking and horses and will support extra heavy cars. Two styles are made, one for wheel and axle work and the other for frame supports. The illustration shows the former style.

Manganese-Steel Sprocket

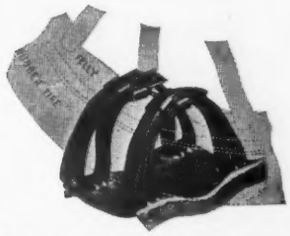
Manganese-steel is used for this sprocket because of its high resistance to wear, thus relieving the owner of the expense and trouble of renewing his sprocket frequently. It is claimed that this sprocket will last as long as the truck, without repair. The sprocket is machine-ground correctly to any chain formula specified. Small steel inserts are used where bolt holes are to be drilled. The higher price of the manganese-steel front sprocket for chain-driven motor trucks is said to be offset by the long life and service it gives. The Michigan Steel Casting Company, Detroit, Mich., is the maker.





Piston Fitted With V-Plex Rings

This ring is made in three segments, the central one being "V" shaped, which causes the two outer ones to press against the side walls of the ring groove. The advantages claimed for this ring are increased power of the motor, increased mileage, proper distribution of oil, uniform pressure against the cylinder walls and the elimination of the knock in the engine. The ring is made of high-tensile, close-grain, hard, spring cast iron. It is sold by the Tri-Plex Sales Company, 1705 Old Colony Building, Chicago, Ill., for from $1 to $1.75, according to size.

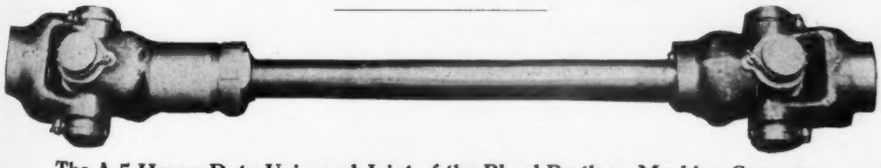


Attachment of Terwedo Auto Mud Shoe

This shows the Terwedo auto mud shoe attached to the wheel rim and tire. It is hard, pressed steel, shaped over a forming die. The under surface is concave, which pushes the dirt or mud into the rut and holds it there while the wheel passes over the shoe. The traction flanges are 7 in. wide and 1 in. deep and the shoe is easily attached by four web straps with patent buckles. A set of two shoes for tires up to and including 6½ in. costs $5.00. Sets of larger sizes cost $5.50. The Nelson-Bacon Manufacturing Company, Oshkosh, Wis., is the manufacturer.

Goodyear Demountable-Rim Wheel

This wheel is made for small cars such as the Ford, Chevrolet 490, Maxwell, Buick 4-34, etc. The construction is straight-grained hickory in the natural wood finish. One size only is furnished, i. e., 30x3½ in. The wheels can be attached in a few hours. The original hub plates, bearings, etc., are retained and there are no extra parts needed. Either a detachable rim or a detachable and demountable-rim wheel can be had as desired. The price of the detachable-rim wood wheel is $18 per set of four. The wheel with the detachable demountable rim costs $25 per set of four. This includes an extra rim for a spare tire. The Goodyear Tire and Rubber Company, Akron, Ohio, is the maker.

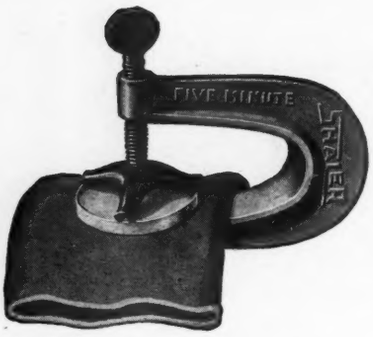


The A-5 Heavy-Duty Universal Joint of the Blood Brothers Machine Company

This new universal joint of the Blood Brothers Machine Company, Allegan, Mich., is designed especially for heavy work on 5 to 7½ ton commercial trucks and Class B military trucks. A yoke with an extra long hub for a slip joint is used.

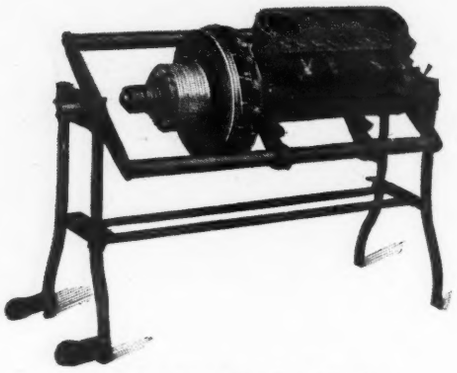
The yoke is a carbon-steel forging guaranteed by the maker against breakage. The trunnion bearings are 1¼ in. diam. by 1½ in. long, and the center block is 2½ in. sq. This new joint will turn in a 6⅛ in. circle and lubrication is furnished to each of the four journal bearings.

THE COMMERCIAL CAR JOURNAL is the only truck journal a member of the Audit Bureau of Circulations—"There's a reason."



The Shaler Rapid Vulcanizer

The Shaler Company, Waupun, Wis., is offering the 5-minute vulcanizer that includes a clamp and twelve patch and heat units. Each patch unit consists of a metal container holding the combustible disc and a patch of Para rubber. The unit is clamped over the puncture and the combustible disc ignited. Enough heat is created to weld the rubber to the tube. The price of the complete outfit is $1.50. Additional patch and heat units sell for 75 cents a dozen.

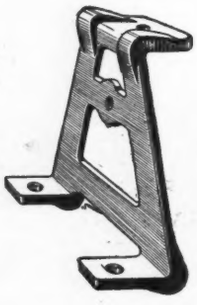


Revolving Stand for Ford Engine

This shows a revolving stand that quickly and easily handles the Ford engine when in the repair shop. It is built of iron and steel and will hold the engine at any angle for convenient repair. The stand is mounted on two wheels at one end, making it portable. The engine is attached by four clamps only, no bolts being used. Prices will be supplied upon request by the maker, The Nonpareil Manufacturing Company, Cochranton, Pa.

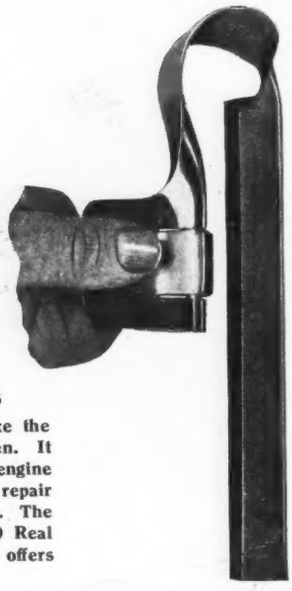
Extra Long Spark Plug for Metz Engines

The J. D. Long plug is made specially for engines requiring an extra long plug. This plug has a knife-edge side-wire that spreads the spark over a wide area and decreases the possibility of burning the wire at any one point. It is made in one size only, 1½ in., and sells for $1. The Spark Plug Company, Toledo Ohio, is the maker.



Crankcase Repair Arm for Fords

This is a cast-steel arm designed to take the place of a regular arm that has been broken. It can be fitted without removing the Ford engine by simply bolting it in position, so that the repair can be made easily and without loss of time. The Hudson Motor Specialties Company, 1530 Real Estate Trust Building, Philadelphia, Pa., offers this device for $1.50.



Klear-Sight Windshield Cleaner

This windshield cleaner is 7½ in. high and slips over the top of the windshield. A rubber strip inserted in the steel body of the cleaner runs against the windshield glass and clears it of rain, snow, dirt and other foreign matter. It is worked by hand from the inside of the car. The U-Auto-C Corporation, 21-23 W. 38th Street, New York City, sells this accessory for $2.

"Hexall" Wrench Set No. 1

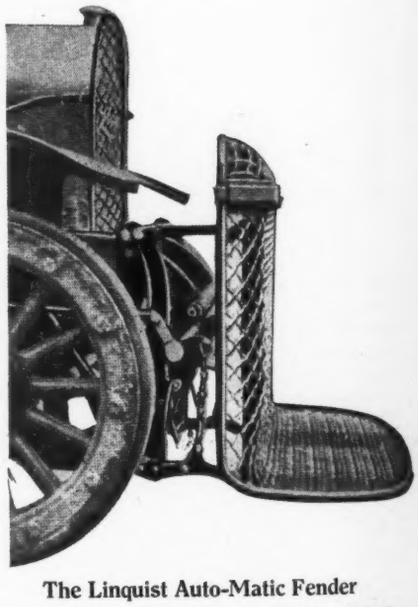
This ratchet socket wrench set contains a 7 in. steel-forged ratchet handle, two screw-driver bits, a 7-in. extension bar, eight hexagon sockets, four square sockets, and is packed in a neat, strong, cloth case. The weight of the outfit is 35 lb. and the price is $4. The manufacturer, R. F. Sedgley, 2311-13 N. 16th Street, Philadelphia, Pa., offers to repair any broken Sedgley wrench free of charge. Other less complete sets sell for $2.50, $2 and $1.75.

The Maltby Dash-Operated Combination Primer, Decarbonizer and Fuel Economizer

The Maltby device is constructed to be attached to any car or truck. It operates by a plunger, the stroke of which is 1½ in. Each stroke draws from the feed pipe and injects into the intake manifold 1½ in. of gasoline. The gasoline is forced into the manifold, through a spray nozzle, with a force that breaks up the gasoline, mixes it with the air and sends it into the cylinders in a vaporized condition.

This attachment can be operated through the radiator or from the dash, as desired. It includes a primer, a decarbonizer and a gasoline economizer all in one unit. It is a double-barreled device designed to keep the engine clear of carbon, to make the mixture lean or rich and to facilitate starting.

The combination attachment is offered for $10 and a simple primer is offered for $7.50. The Maltby Auto Specialty Company, Dime Bank Building, Detroit, Mich., is the manufacturer. The illustration herewith shows the attachment as used on the Ford car.



The Linquist Auto-Matic Fender

This fender is designed to prevent accidents by automatically picking up anything it strikes. It is raised and lowered by a parallel arm movement. The upper arms contain cushion springs that act as a recoil when striking an object. The fender can be adjusted by brackets to any distance above the ground. It is made of steel with an enamel finish and is adjustable to fit all trucks, delivery cars, etc. The bottom apron can be had in any length desired. Wm. A. Linquist, 901-3 Marquette Ave., Minneapolis, Minn., is offering this accessory.

Advertising appropriations bring greatest returns when expended in the CCJ

TRAILER DEPARTMENT

Impressions From a Study of Trailer Transportation

By J. CROW TAYLOR

HAVING occasion sometime since to write a series of half a dozen articles for one of the lumber trade journals I was naturally moved in the course of gathering data and preparing these to a study of the motor truck in various sizes and from many different angles. Two phases of the subject that attracted more than the usual amount of interest and thoughtful research were made up on the one hand of the conversion of passenger machines, new and second-hand into light trucking vehicles, and on the other hand the adding of trailers one way and another to supplement the hauling capacity of the motor truck proper. In the trailer idea itself I found several interesting features that involved not merely supplementary loading of the truck itself, but included as a factor of considerable importance the use of trailers attached to runabout passenger machines. First and last I was impressed with the idea that the trailer in its past, present and future, or rather the study of it, would make up one of the most interesting tales of the development of the commercial vehicle industry.

Trailers in the Lumber Industry

My attention was first drawn to the trailer in this study in connection with some of the fairly heavy trucks used in the delivery of lumber. Some of the operators using 3½-ton trucks and reporting on their results said they had been able to increase the usefulness and the returns from the truck by making them pull trailers. These not only helped out by increasing the quantity taken at one load, but they often shortened the idle time in the process of loading and unloading. Maybe the truck would be out on a trip and while preparing a load for the truck and getting it in shape for prompt handling the yard man would also load the trailer, so that when the truck came in and received its own load it took only a moment to hitch up the trailer and take it along. The study of the use of the trailer in this way sounded interesting, and by following it up it was found to be an idea growing in prominence, and to include another feature, that of helping distribute the load upon more wheels and getting more bearing for going over soft ground, which in many instances proved to be an item worthy of consideration.

Meantime there came to hand a publication devoted to agricultural implements with a feature article about the trailer and its sale and use possibilities among the farmers. This featured the trailer as a vehicle for light service and for hitching a load on behind the farmer's automobile in going to town, which furnished a different angle for my view of the subject, and also figuratively turned time backward and called attention to the fact that the trailer is really older than the motor truck or the automobile itself. Indeed even before we had developed mechanical power we had long made use of the idea of pulling a load along on wheels. An illustrative example is in the stories of one of the pioneer methods of marketing tobacco, which was put in a hogshead and a pivot arranged on each end; a team of horses or oxen then being hitched to it, rolled it along as a trailer.

Following this original method of drawing a load on the ground by the rolling process came the two-wheel cart, which invariably trailed along behind the motive power, and this in time was succeeded by the well known four-wheel wagon, which is nothing more nor less than a trailer with horses, mules or oxen for motive power instead of gasoline. Nor is that all of the early tale of the process of evolution. When we developed the first steam engine, which was the grandfather of the later steam traction road engine, it was made to pull a carriage in the form of a trailer behind it, and even when this was mounted on tracks, out of which we evolved the railroad locomotive, the trailer idea clung persistently to it and the load was drawn along behind the engine.

Then when the first dirt road power tractor came in the form of the steam traction engine it carried the trailer idea with it. The steam tractor itself was not a carrying vehicle, but a pulling unit. It took the development of the automobile itself and the internal combustion engine, first known as the horseless carriage, to bring severance for a while from that ever accompanying trailer idea.

This divorcing of the machine from the trailer held through all the primary stages of automobile development and was carried over into the first big development of motor trucks themselves. Indeed it still obtains to quite an extent, but there is now a strong indication that this divorcing of the trailer from the machine is about to be done away with and that the two will become as one again, and the trailer come into recognition as a part and parcel of practically all commercial vehicle work, except such light quick trucking as involves covering distance rather than hauling loads.

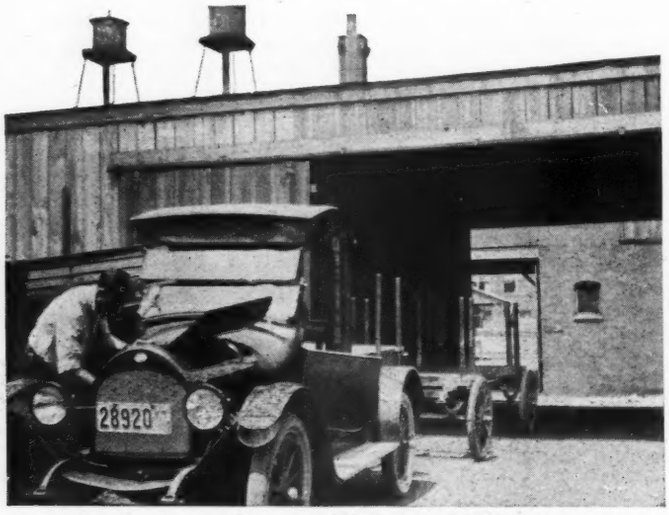
A Short Bed Trailer to Attach to Either a Truck or an Auto

This line of thought is being borne out by things encountered in the lumber industry since, things that present the trailer from a new angle as compared to that of hitching it on as a supplement to a heavy truck. The trailer is entering as an addition also to the lighter trucks and even in connection with runabout passenger machines.

Several interesting instances of this use of the trailer have been encountered in the rounds. In one lumber yard it was found that the owner after studying the truck problem over and revolving it round and round in his mind, had bought an Overland runabout passenger machine and had it converted into a light, short-bed truck,

and then he hitched a trailer on behind. With this combination he could handle light orders for quick delivery with the machine itself, which retained the usual passenger gears and speed, but had the back wheels replaced with solid tire wheels. Then when a somewhat heavier load was to be moved the trailer was hitched on, which made it practical to handle from one to two tons on the trailer. This machine, with its trailer, would haul on the trailer practically the same load that could be hauled with a pair of mules, but would cover more than twice the territory, make more trips, do more work, in fact, it will do the work of practically three teams. To round out the equipment fully, however, there should be two trailers instead of one, so that a trailer could be left behind for unloading and loading and shorten the idle time of the machine itself. The same machine is used for runabout work in selling lumber and visiting contractors.

After looking over this interesting example there came to mind the question of the possible different types of trailers, and whether or not the trailer in this instance was of the same type that had been referred to by the first man, who had introduced trailers to my attention in this connection as supplements to 3½-ton trucks. A trip to the yard, where such a truck was at work, showed that the trailer used behind it was identical with the trailer used behind the Overland runabout. A little further inquiry and research brought to light another trailer at this place, a recently acquired one, somewhat shorter, and provided with special bed, which was being used with the runabout machines of the city salesmen and of the superintendent. In this case Ford machines were used and when light loads were wanted one of the runabout machines would hook on to the trailer and make the trip, often in connection with other business. So the trailer idea even here was being enlarged to include hitching on to runabout machines, as well as on to the heavier duty trucks.



A Short-Body Converted Overland Runabout With Trailer Behind

This brought into the question of the trailer several interesting thoughts and speculative ideas. One of these is why the same make of trailer should be used for hitching behind a runabout machine as is used for hitching behind the heavy duty trucks. In wagon work usually the heavier the motive power the heavier the wagon was built, and the heavier the load put upon it, and if this idea had been followed in the trailer those behind the big truck would have been in proportion with the truck itself, while those used behind the light runabout machines would have been of equally light structure. Another question suggesting itself here is why not use some of the regulation wagons with their steel tires—simply providing a different tongue and attaching to trucks?

In a way these questions all merge into one point, the point of distinction between the modern trailer idea and the old familiar wagons. The modern trailer or wagon, as it is being developed in connection with commercial vehicles, is constructed on anti-friction lines. It is either roller or ball bearing, which in turn seems to necessitate the rubber tires. This makes the trailer light and easy to handle in the yard by hand and also makes it easier to pull on the road and the cause of less strain and shock on the motor pulling it.

The more delicate workmanship of the anti-friction bearings, the hub and axle get-up are plainly the things which make necessary the rubber tires to replace the old steel tire, and this of itself helps reduce the friction and the wear and tear on the motor; in other words, helps to make the load lighter. The modern trailer, as compared to the old-time wagon, typifies lightness and easy running rather than ruggedness and hard pulling, which were an accompanying part of the older wagon and the rough roads. It is such a decided improvement in comparison that it should really sound the death knell for the old cumbersome wagon, even where horses and mules are used, because a modern trailer with a tongue on it for hitching to horses or mules would furnish a much better commercial vehicle than the old-time wagon, so much better in point of eliminating friction and reducing the work of hauling that there would seem to be almost as big a field for promoting the sale of that vehicle among those using horses as in connection with motors themselves.

One can hardly survey analytically the field of activities among commercial vehicles without coming to the conclusion that the trailer as a supplement to the truck and to the runabout machine is unquestionably the thing of the near future, and that the possibilities for returns by its use in this way are too great to be neglected, particularly as the investment required is comparatively light.

There are a number of questions and problems that enter incidently which must be given consideration. One of them is the question of the additional strain the trailer will put upon either a machine or a truck. One enthusiast figured out some time ago that the average machine or truck will pull a loaded trailer with an additional cost of only 10 per cent. for fuel requirements over the maximum requirements for the car or truck itself. This is a perfectly natural presentation for a trailer salesman to make. But there is another side of it to be considered, that of the strain on the machine, and the possible shortening of the life of the original machine or truck. This question was brought out in the rounds in connection with the instance of where a converted Overland was found pulling a light trailer, as Fords and the lighter, cheaper machines had been almost invariably used and converted into light trucks. The man was asked how it happened that he turned to an Overland instead of a Ford; whether or not he had just happened to have an Overland machine which he converted? He said no, that after thinking the matter over he figured that the Overland would give him more power and perhaps stand up better under the heavier pull necessary with the trailer attached, and he had bought a new machine of this type, having it converted because he thought it would give him more engine power and more service.

This brings to mind the thought and the question of motor trucks and their construction and whether or not the more general use of trailers will call for some revision of truck construction with a view to the trucks pulling trailers as well as their own loads. There are several questions of this kind of detail that time will answer. Meantime the trailer is coming along, and eventually when all the history of the automobile and the commercial vehicle is written it will be found that the tale of the trailer will make up some of its most interesting and valuable chapters.

In France, and especially in St. Etienne, commercial cars are being used more and more as a result of the war. Many pleasure cars have been rebuilt for light delivery purposes. American passenger cars are very popular in this district, but American light delivery cars are practically unknown, while U. S. made heavy duty trucks are used extensively. Trucks, scrapped by the War Department, may be purchased at low prices and are in good enough condition for commercial use. St. Etienne has recently purchased a fleet of trucks for use in carrying merchandise.

The CHILTON ideal—honest circulation; results to advertisers—fully exemplified in the CCJ

The "Centiped" Motor Truck and Tractor

THE Phoenix Mfg. Co., Eau Claire, Wis., is offering the Centiped truck and tractor, designed particularly for trucking over ordinary country roads for road building and grading also. In place of the usual drive wheel the Centiped has the endless track drive.

The power plant consists of a four-cylinder engine burning gasoline or motor spirits, size 5½ x 7 in. It is a heavy duty engine and has double ignition system. Two gasoline tanks are furnished. Fuel is taken from the 40-gal. tank at the rear to a 20-gal. tank under the front seat.

The truck has three speeds forward, producing 1½ to 5½ m.p.h., and also a reverse speed. Transmission and differential gears are made of special steel, heat treated and fully enclosed in an oil-tight case.

The outer belt or endless chain drive is made up of sections coupled together with links, pins and bushings. They have been operated successfully in mud and sand and the wear has not been found excessive. All the working parts are 6 in. above ground. In heavy snows, runners are substituted for the front wheel.

The average gasoline consumption is 2 gal. per hour; of oil, ¾ gal. in 10 hours; 2 gal. of cheap black oil per day provide sufficient lubrication on the traction wheels. The tread chains on this machine are 12 in. wide and have a 5-ft. bearing surface which is a total of 10 sq. ft. under each machine. Chains can be made any width desired for heavier machines.

A View From the Side of the "Centiped" Combination Tractor and Truck
Power plant consists of a four-cylinder, 50-h p. engine, 5½-in. bore, 7-in. stroke

Illustrating the Flexibility of the "Centiped"
The traction wheels are 12 in. wide and each has 5 sq. ft. of bearing surface

The "Centiped" Hauling Five Four-Horse Loads Out of a Gravel Pit

A Heavy Turnover Being Made by a "Centiped"
Plowing white oak cut overland. The furrow is 30 in. wide and 12 in. deep

The rolls used in the roller chains are 3 in. in diameter and are made of a high-grade material, hardened by a special process. Changes can be quickly made at little cost. All wheel bearings are housed and made practically dust-proof.

The box body supplied with the machine was especially intended for carrying supplies and tools necessary for the operation of the tractor.

UNITED STATES MOTOR TRUCK CO., Cincinnati, O., received orders for 110 trucks in a week, recently. This was the biggest week in the company's history.

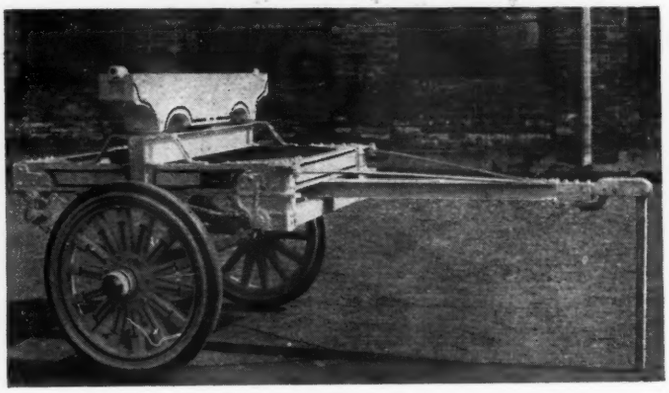
THE STANDARD MOTOR TRUCK CO., Detroit, Mich., has made several mechanical changes in the construction of the two models of Standard trucks—in the cooling system and in the transmission. The change in the cooling system consists of the adoption of a radiator of the vertical type with a new design of cast tanks. The radiator is made in sections, with a core which may be easily removed. The top tank can be taken off and any defective tubes taken out.

Everybody who is anybody in the truck industry reads the CCJ

Special Pipe-Carrying Trailers for the Oil Fields

Two special two-wheeled trailers, known as model D-10 and D-20 respectively, are being produced by the Warner Mfg. Co., Beloit, Wis. They are designed especially for work in the oil fields, carrying 20- to 30-ft., 5- and 6-in. oil casing, and pipe from 18 to 22 ft. long. They are also used for transporting all the incidental material and equipment in connection with oil wells, such as boilers, bits, rigging timbers and other material required in the operation of oil wells.

A 3-ton truck with a model D-10 trailer rated at 3500 lb. capacity is said to easily handle a 5-ton load under conditions prevailing in the oil fields. Both models are equipped with a patented hitch socket that forms a universal joint with the ball fastened to the rear end of the truck. This feature provides flexibility and security.



The Warner Pipe Trailer With Drawbar That Extends From 7 to 14 ft.

The capacity of Model D-10 is 3500 lb. It has a tread of 56 in. for a frame 56 in. long and 46 in. wide. The drawbar is 7 ft. from the center of the axle to the centre of the hitch ball, with two adjustments to 10½ and 14 ft. The height from the ground to the top of the bolster is 54½ in. and the bolster is 57½ in. long inside the stakes. The frame is channel iron with steel corner irons.

The axles are 2½-in. alloy steel; the spindle bearing diam. is 1 15-16 in., and the hub is Sheldon Dragon 3 x 48-in. alloy steel. Semi-elliptic springs are used. The wheels are artillery type with 14 spokes and 36 x 4-in. solid pressed-on tires. The shipping weight is 1590 lb.

Model D-20 is of heavier construction for a 5500-lb. capacity. Its shipping weight is 1915 lb.

New York State Law and Tax

For the benefit of those who are not fully informed on the New York State motor truck trailer bill, which went into effect August 1st, that portion relating to fees is published herewith. The bill states the law in the following terms:

"Every owner of a vehicle, commonly known as a trailer, for the transportation of goods, wares and merchandise, not propelled by its own power, to be drawn on the public highways by a motor vehicle operated thereon shall also make application for the registration thereof in the manner herein provided for an application to register a motor vehicle, without the statement relating to motive power; but the application shall set forth the combined weight and carrying capacity of such trailer.

"Registration fees for trailers. The foregoing provisions of this section in relation to registration books and registration, certificates of registration, number plates, duplicates of certificates and number plates, times for registration and re-registration and the duration thereof, for motor vehicles, shall apply also to trailers. The following fees shall be paid to the Secretary of State upon the registration or re-registration of a trailer in accordance with the provisions of this article:

"For each trailer having a combined weight of truck and carrying capacity of two tons or less, the annual fee of five dollars.

"For each trailer having a combined weight of truck and carrying capacity of more than two tons and not more than five tons, the annual fee of ten dollars.

"For each trailer having a combined weight of truck and carrying capacity of more than five tons and not more than seven tons, the annual fee of fifteen dollars.

"For each trailer having a combined weight of truck and carrying capacity of more than seven tons and not more than ten tons, the annual fee of twenty dollars.

"For each trailer having a combined weight of truck and carrying capacity of more than ten tons and not more than fourteen tons, the annual fee of thirty dollars.

"For each trailer having a combined weight of truck and carrying capacity in excess of fourteen tons, the annual fee of thirty dollars and the additional fee of five dollars for each ton in excess of fourteen tons.

"Provided that if any such trailer for which a fee is herein provided, is originally registered after August first in any year, the register fee for that year shall be one-half of the fee herein provided for such vehicles.

"Provisions relating to trailers. No person shall operate or drive a motor vehicle drawing a trailer on the public highways of the State after the first day of August, nineteen hundred and seventeen, unless such trailer shall have a distinctive number assigned to it by the Secretary of State and a number plate issued by such secretary with a number corresponding to that of the certificate of registration displayed and fastened in the manner provided for number plates on a motor vehicle, nor unless such person shall also have with him the certificate of registration of such trailer. Such certificate shall be exhibited on demand to any peace officer or representative of the Secretary of State. The provisions of this section relating to number plates for a particular motor vehicle shall apply to number plates for any such trailer, except that the word 'trailer' shall also appear on such plates."

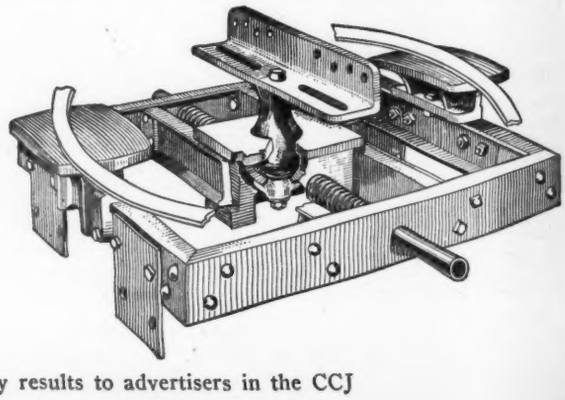
Fifth Wheel Absorbs Shocks

Designed to aid in the perfection of the semi-trailer, the new King-Irwin fifth wheel has a universal motion and shock absorbing qualities. The wheel makes the operation of the tractor semi-trailer easy under severe conditions and enables it to be loaded and unloaded easily.

The attachment is fastened to the truck frame directly over the rear axle. The semi-trailer is then connected with the truck by a ball and socket joint. Broad friction irons are attached to the part of the fifth wheel on the truck. The circle that is furnished is attached to the semi-trailer. This circle comes in contact with the friction irons when rounding corners or when the body of the semi-trailer is not level.

The cross-head, containing the socket, is held in suspension by springs under the frame of the wheel. The springs are placed in position under slight compression, which tends to suspend the cross-head in a central position. This feature also eliminates starting road shocks that jar and strain the tractor.

The King-Irwin fifth wheel is the standard width for attachment to any converted truck unit or commercial truck. Special frames are made for attaching to pleasure car chassis. The wheel is made by the King Trailer Co., Ann Arbor, Mich., in three sizes: A 1½-ton size having 20-in. circle, is designed for use with Ford roadsters, and sells for $50; a 3- to 5-ton size has a 32-in. circle and sells for $85; a 6- to 10-ton size, designed for heavy duty hauling, has a 34-in. circle and lists at $125.



An Assembled View of the Working Parts of the King-Irwin Fifth Wheel With a Ball and Socket Connection

Plenty of the right kind of circulation means quantity results to advertisers in the CCJ

How and When a Trailer is Economical

THE strongest arguments in favor of the adoption of the trailer as an auxiliary to the truck are: First, increased carrying capacity; second, reduced hauling costs. Economy and efficiency in truck-trailer operation are insured if due consideration be given the character of the material to be hauled and its relation to the trailer equipment, loading and unloading methods, etc. This statement is based upon the presumption that a preliminary study of the local hauling conditions has shown that the roads are hard-surfaced and that the maximum grades do not exceed 10 per cent.

On long hauls, the lowest hauling costs are obtained where the tonnage moved per trip is greatest. In such cases the additional hauling capacity afforded by the use of trailer assumes prime importance. If the truck hauls three tons working alone, when with the trailer equipment it might just as well haul six or more tons at a very slight additional operating expense, the value of the trailer is apparent.

On long hauls the question of speed is an important factor. The trailer must be built to run as fast as the truck can pull it. A slow-speed trailer, by limiting the speed of the truck, nullifies the advantage to be gained by carrying the double load. If, however, it is impossible to operate the truck at its normal speed in districts where the traffic is congested, the use of the trailer will offset the loss occasioned by the reduced speed.

Where the hauls are short the item of lost time, i. e., the time spent in loading and unloading truck, assumes first importance. It is imperative, therefore, that this lost time be reduced to the minimum. The truck, to be a profitable investment, must be kept moving. It is too costly an article to be used as a loading platform, and should be kept under pay load as much of the time as possible. This may be accomplished by the use of one or more trailers. Extra trailers may quickly be put in or taken out of service, and when not in use represent a much smaller investment than the same carrying capacity in motor trucks.

How Trailers Are Used Economically

If any one trailer is used it can be loaded while the truck is making the trip alone, and be picked up by the truck on every trip. Two trailers can be used to still better advantage, while a fleet of three trailers makes a very efficient hauling unit, especially where loading and unloading take up a large part of the truck's time. In the latter case it may be found good practice to use the truck only as a tractor and keep it in motion almost continually. One trailer may be kept at each end of the haul, while the truck is in transit with the third trailer.

To illustrate the importance of utilizing the trailer as a loading platform, in place of the more expensive truck, consider the following:

A conservative estimate of the operating cost for a 5-ton truck is $16 a day. Every minute this truck is not in motion it costs 2 2-3 cents—every hour, $1.60. The truck not only makes no money while standing still—it loses money. It makes money only while in motion. If it can be kept moving ten hours a day, so much the better. The profits will be correspondingly greater.

If the trailer costs $4 a day to operate or 2-3 cents a minute, or 40 cents an hour, for every hour it is used in place of the truck it saves the difference between $1.60 and 40 cents. Moreover, to this amount must be added the profit the truck makes when it is kept under pay load. When truck is running it not only makes the $1.60 an hour operating cost, but a profit besides. When it is standing still it loses the $1.60 an hour operating cost plus the profit it might have made by being under load.

On short hauls the reversible feature of a trailer is a great saver of time and labor. With a reversible model it is not necessary to turn the trailer around, as the truck may be attached to either end, and the trailer can be backed easily into any position desired. It is not necessary to laboriously detach the draw-bar from one end of the trailer and fasten it to the other, as both ends are alike. The only time lost in reversing the trailer is the time it takes the truck to turn itself and back into position to receive the coupling link.

The item of reversibility saves more time than might be imagined. For example, if it takes six minutes to reverse an ordinary trailer which makes four trips a day, it must be turned around or reversed at the end of every trip, or eight times during the day, with a total elapsed time for the day of forty-eight minutes. This is time lost in more ways than one, as the running time of the truck is reduced and the working time of the labor is curtailed. The helpers must stand around until the turning or reversing operation has been completed.

Operating Expense of Trailer

	Per Day
First cost of trailer, equipped with 7-in. rubber tires, $1,540. Life, 5 years, working 300 days a year (1500 days)	$1.03
Tire cost, based on price to consumer (from list), $341.52. Mileage guarantee, 7000. Assuming trailer will run an average of 40 miles per day..	1.95
Repairs at $50 per year (estimated)..	.17
Insurance—fire, liability and property.	.16
Interest, 6 per cent. yearly on $1,540..	.31
License fee, $15 yearly	.05
Increase of gasoline consumption and tire wear on truck, estimated at 10 per cent.	.37
Total operating expense of trailer....	$4.04

For the purpose of comparison, we have made the life of the trailer five years. As a matter of fact, under average conditions, it will last indefinitely, as it is not subjected to as severe strains as is the truck.

There is no reason to believe that the amounts charged to trailer repairs will be as high as the figures given. These figures are much more liberal than past experience in trailer repair would seem to warrant.

Many trucks carry a helper, which slightly increases the operating cost of truck. When the trailer equipment is added, this makes the cost figures still more pronounced in favor of the trailer, as the carrying capacity of truck is doubled with no additional labor cost.

It should be understood that the foregoing costs have been figured at prevailing market prices and as nearly accurate as possible, but they may not fit individual cases as the costs vary so widely, in class of work, cost of materials, road conditions, material to be hauled, etc.

Taking the figures given in the first column as the operating costs of a 5-ton truck, we may calculate the various items of the two following comparative tables:

5-ton truck Without trailer		With trailer and no extra helper.	With trailer and one extra helper at $2.50 per day.
Days per month operated	24	24	24
Mileage covered	863	863	863
Average mileage per day	35.96	35.96	35.96
Cost per day operated	$15.82	$19.86	$22.36
Cost per mile	0.44	0.55	0.62
Cost per ton mile, cents	8.7	5.5	6.2

THE NET EARNINGS OF THE STANDARD PARTS CO., Cleveland, O., for the first six months of the company's existence were more than 28 per cent. on the common stock after liberal depreciation, but before deduction for excess profits tax. Over 90 per cent. of its output is being sold to manufacturers of truck and pleasure cars selling at less than $1000 and since the popular-priced automobile industry is very prosperous, there has been no decrease in the amount of business.

NELSON BROS. CO., Saginaw, Mich., is exhibiting a 2-ton truck, the first of the new Jumbo line to be manufactured by that concern. It is planned to manufacture about fifty of these trucks within the next two months. An addition will soon be made to the factory permitting the manufacture of nearly all the units. For the present time the truck is being assembled in the Nelson plant. It is expected that the price will be popular, although it has not been definitely fixed.

Opportunity comes to the well-informed. Read the CCJ

Lane Truck in One- to Five-Ton Capacities

THE Lane Motor Truck Co., Kalamazoo, Mich., is manufacturing a line of motor trucks which comprises 1 to 1½ ton, 2 to 2½ ton, 3½ and 5 ton capacities. As yet, however, the 5-ton model is not ready for the market. 160-in. wheelbase is standard, with an option for 180 in. for special types of service. The price of Model "C," the 3 to 3½-ton truck, is $3250 f.o.b. Kalamazoo. This truck is equipped completely with electric lights and starter as standard equipment.

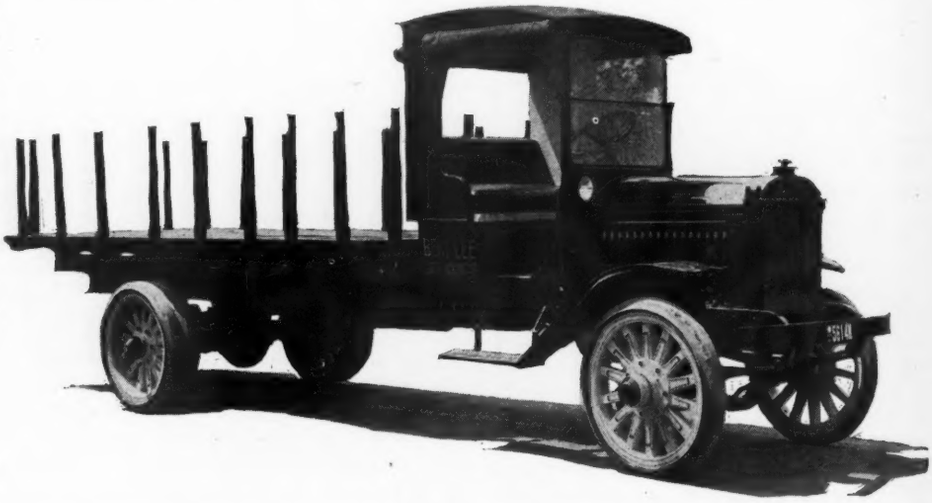
In details of construction Lane trucks are apparently designed to give maximum service. This is noticeable in minor details as well as in the major parts of the truck. Stephangers are of steel and are extremely strong and rigid. There is a 3-in. channel steel bumper. The gasoline tank, which is under the seat, is cylindrical in form and acetylene welded. Its capacity is 24 gallons and it operates through a Stewart vacuum feed. The hood has removable sides, making the engine very accessible. Flooring and footboards in the driver's cab are unusually substantial, being bolted directly to the dash bracket, which is made of cast metal. Equipment includes tool kit, jack, oil can, electric head lamps, electric tail lamp and electric horn.

Power Plant of the Three to Three and a Half Tonner

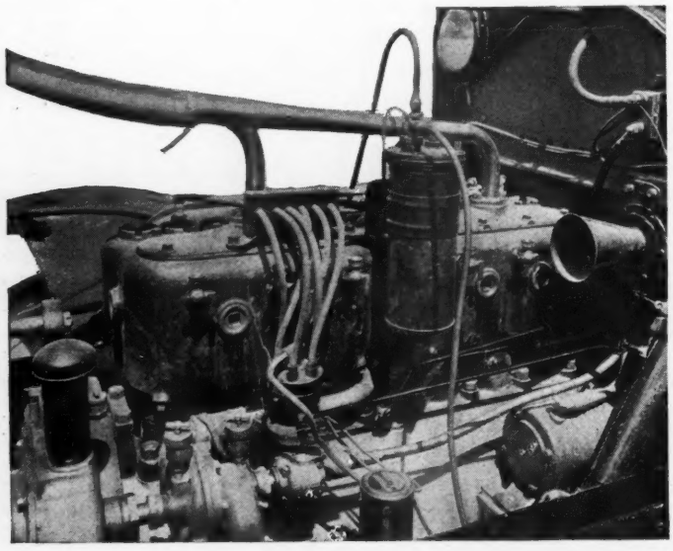
A Continental 3¾ x 5¼-in. engine with 34 h.p., S. A. E. rating, is used. This engine is of the L-head type with enclosed valves. Lubrication is of combination design, forced feed to main and cam bearings, with splash to rods and pistons. Three-point suspension frees the engine from all strain when the vehicle traverses road inequalities. A Stromberg carburetor with hot-air jacketed intake is used. In connection with this carburetor, a speed governor is also supplied.

A two-unit system of generator and motor, in connection with a Willard storage battery, is employed for starting and lighting, as well as ignition. The lamps are afforded unusual protection because of their high position and design. They are set into concaves which are cast integral with the metal dash. The tail light is set into a recess in the rear cross member of the frame.

Positive water circulation is obtained by means of a centrifugal pump in connection with a Lane radiator. The Lane transmission is mounted amidships on roller bearings and is of the independent sliding gear type with three speeds forward and one reverse. Drive from the engine to the transmission and from the transmission to the rear axle is through universal joints which are well protected from dust by close-fitting housings. A dry plate, disc clutch with Raybestos lining furnishes flexible and positive engagement between the engine and transmission.



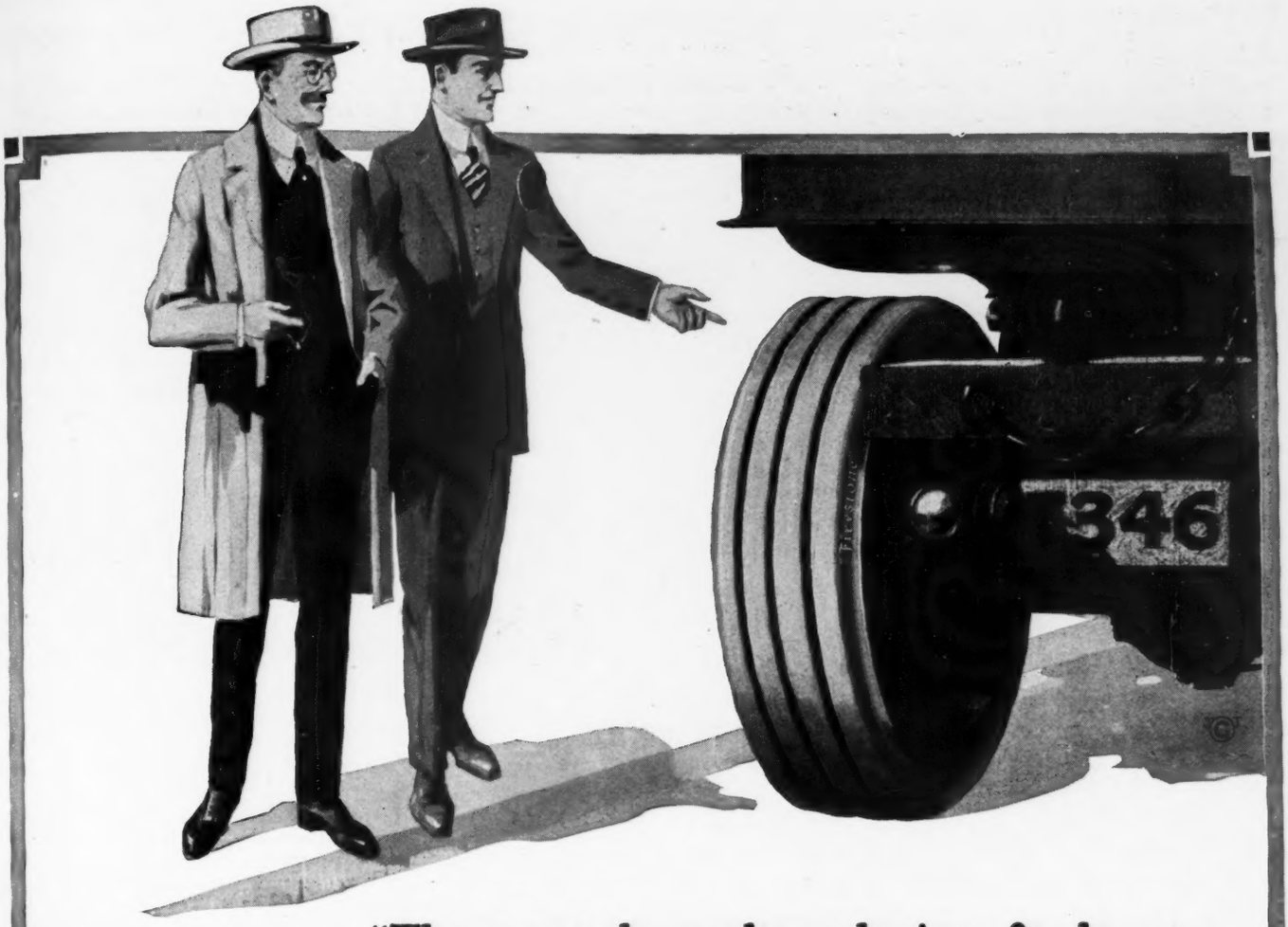
The Model B, Two- to Two-and-a-Half-Ton Lane Truck Fitted With a High-Stake Body



Left Side of the Engine, and Its Accessories

Showing the starting motor, Stewart-Warner vacuum tank, distributor, oil filler and the water pump.

The front axle is an I-beam section, drop-forged in one piece, measuring 2¼ x 3⅜ in. A feature of this axle is not only the bearings for the wheels, but also the top of the steering knuckles, which carry the load and make steering remarkably easy. The spindle itself is 2⅜ in. diameter. The rear axle with worm-drive is the equipment used on the Lane. The worm is steel and the worm wheel is bronze. Springs are semi-elliptic, both front and rear, 3 in. wide by 42½ in. long in front and 3½ in. wide by 56 in. long in the rear, with top leaves of special alloy steel. A band is pressed around the rear springs hydraulically, which fits into a special plate, through which also passes the conventional form of spring clips. A feature with the spring hangers is that the spring shackle-bar is in the form of a continuous rod extending across the truck, ty-



"There are the real truck tires for heavy service, Firestones. I know them by their Size and the Grooved Treads."

THE MOST distinctive tire in appearance as well as performance is the Firestone Giant Truck Tire. When you see this Giant tire you know it's a Firestone. And you have seen many of them.

IN SOLVING the problem of properly curing this bulk of rubber into a single tread of efficient design, Firestone engineers gave practically unlimited scope to the utility of the motor truck. Loads that were impossible before are now the rule on these tires. Roads that were impassable are easily traveled. Notice how many you see in city and country work. And note that they are on trucks of firms of large fleets and long experience in hauling.

THIS MASSIVE single tread is absorbing strains and shocks at all times, regardless of irregularities in the road. More rubber means more resiliency. More traction means less fuel. The Firestone Grooves or Flutes in the tread mean Skid prevention and uniform wear. Net results: better service and Most Miles per Dollar from tires and truck.

FIVE SIZES, 7, 8, 10, 12 and 14 inches, supply you with a Firestone Giant Tire for all the most difficult medium and heavy duty trucking. Call in a Firestone man. He will tell you of this remarkable tire and all our other types, one for every road, load and condition of service.

FIRESTONE TIRE AND RUBBER COMPANY
Akron, Ohio Branches and Dealers Everywhere

Firestone GIANT Truck Tires

The Big Tires With the Grooved Treads

ing the spring hangers on both sides of the truck in such a way that there can be no disalignment. The Lavine steering gear, of unusually large dimensions, is the equipment used on the Lane. Both emergency and service brakes act internally upon large area rear wheel brake drums. Wheels are of the artillery type, 36 x 5 in. dual rear and 36 x 5 in. single front. Tires measure 36 x 5 in. front and 36 x 5 in. dual rear.

The Two-Ton Stewart Truck

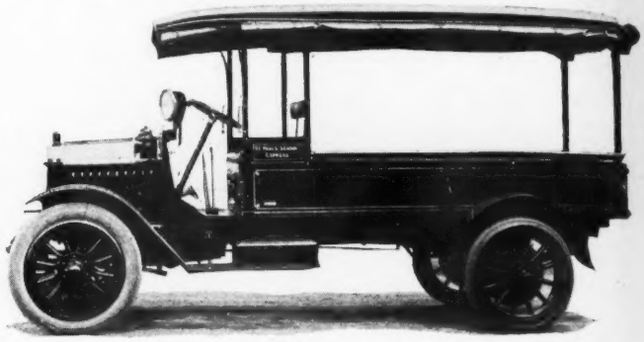
The Stewart Motor Corp., Buffalo, N. Y., is offering its new 2-ton capacity truck, which is said to be noted for its durability, efficiency and economy. The loading space on this two-tonner is suitable for 10, 11 or 12-foot bodies. The wheelbase is 156 in. and the price of chassis $2100.

A Buda 4⅛ x 5¼ in. engine, rated at 40 h.p., is employed. Circulation is by a water pump. The carburetor is 1¼ in. Zenith, equipped with an engine driven governor. The radiator is of the armored tubular type, while the clutch is a multiple dry plate. Transmission is of the regular selective type, three speeds forward and one reverse. It is equipped with extra-heavy, double row, annular bearings, nickeled steel, heavy gears and also chrome nickel shafts. The drive shaft has three universal joints, with the center joint supported on self-aligning ball bearings. The front axle is a heavy, drop-forged, heat-treated I-beam, with 1¾ in. spindles equipped with Bower roller bearings. The rear axle is a Celfor internal gear drive, 16 in. diameter and 3 in. wide. The frame is 5⅞ in. deep. 2½ in. wide and of ¼ in. stock. Side rails are straight and parallel and measure 32 in. outside.

Springs are Detroit Steel products, the front measuring 2½ in. wide, 41 in. long and bushed with oilless bearings. The rear are 3 in. wide, 54 in. long and are also bushed with oilless bearings. Steering gear is of the heavy Ross truck type, with large wearing surfaces and an 18-in. wheel. Wheels are of the heavy artillery type, with semi-round spokes. Front wheels have fourteen spokes, 2 in. diameter, while the rear have fourteen spokes, 2½ in. diameter. Front tires measure 34 x 4 in. and are of the solid, Swinehart, pressed-on type. 4-in. dual tires are on the rear wheels. Equipment includes a front bumper, two side and one rear oil lamps, tool kit, tool box on running board, mechanical horn, driver's seat and a 16-gal. capacity gasoline tank.

Concord Worm-Drive Trucks

TO meet present-day demands the Abbott & Downing Co., Concord, N. H., has entered the motor truck field in addition to its wagon building. This entrance is made with the new Concord truck in two sizes, a one- and two-ton chassis. Other sizes will be produced in due time. The company is said to have secured the services of very capable automobile engineers and the vehicle is of high-grade material and workmanship. It is simply constructed and is claimed to have an abundance of power. The chassis are very similar in respect to specifications and only the differences will be noted in the following:



The New Concord One-Ton Model "B" Truck

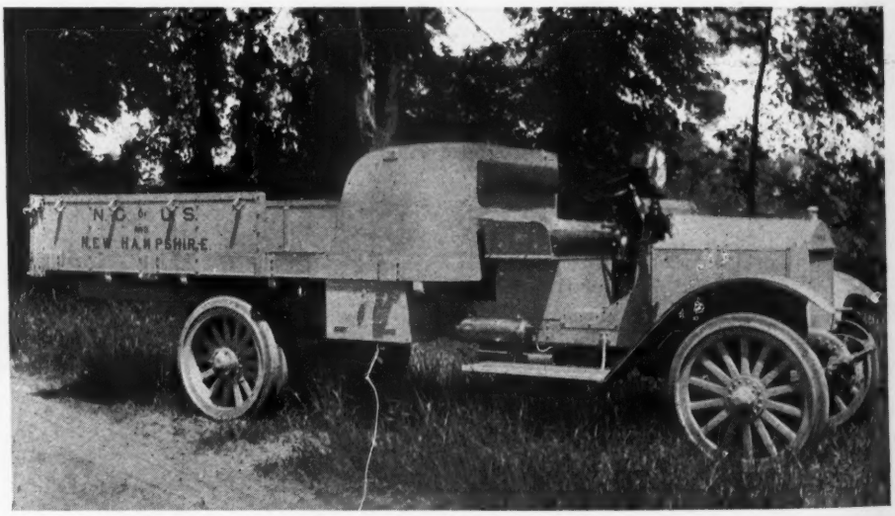
This new offering to the trade has a maximum body length of 106 in. and the frame length back of the seat is 98 in. The wheelbase is 130 in. and the price $1750.

Power Plant of Two-Ton Chassis

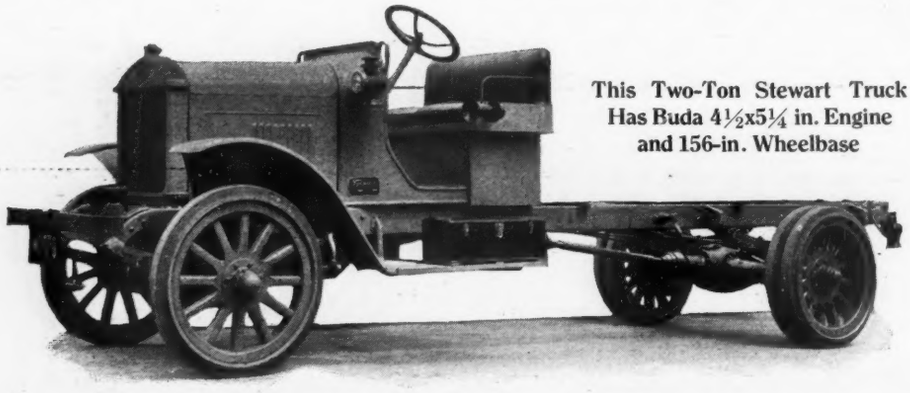
The 2-ton model "A" truck is of the worm drive type, and has a Buda four-cylinder, L-head engine. The cylinders are cast in block and measure 4¼ x 5½ in. It is in unit with the transmission. The 1-ton model "B" chassis is also of the worm drive type and has a similar but smaller engine, measuring 3½ x 5⅛ in. Both have a Zenith carburetor of the fixed jet, float type with choke for easy starting. Ignition is of the Eisemann direct, high-tension type, with fixed spark. Lubrication is force feed by pump to main bearings, combined with the constant level, splash system.

The radiator is of the tubular section with protected front, detachable cast tanks, top and bottom, and is mounted on trunnions. Clutches are of the multiple disc, dry plate type, and the transmission is the regular sliding, three speeds forward and one reverse. Drive is through a propeller shaft and Spicer universal joints to the Timken-David Brown worm and gear rear axle. The front axle is a Timken I-beam fitted with Timken bearings. The rear is a Timken-David Brown worm drive of the full floating type on the 2-ton model, while it is of the semi-floating type on the 1-ton model.

There are two pairs of Duplex brakes faced with wire-woven asbestos fabric, expanding in each rear wheel. Frames are of heavy pressed steel and measure 5⅝ in. deep, 2 in. wide and 7-32 in. thick on model



The Concord Two-Ton Model "A" Truck Fitted With a United States Army Type Body



This Two-Ton Stewart Truck Has Buda 4½x5¼ in. Engine and 156-in. Wheelbase

Advertising in the CCJ is memory insurance. "Out of sight, out of mind," you know

Ross Gears

THE merchant or manufacturer who knows and appreciates their superior quality in design, materials and workmanship, insists upon ROSS GEARS as steering equipment on the motor trucks that he buys. ¶ He has every reason to believe that the motor truck manufacturer who has been willing to pay a little more to give his customers the added assurance of safety, reliability and easy steering that ROSS GEARS guarantee, has probably given the same careful thought to the entire make-up of his truck. ¶ One hundred and fifteen different makes of motor trucks, representing considerably over half the industry, are steered by ROSS GEARS.

Write for catalog and other information desired

ROSS GEAR & TOOL COMPANY
760 HEATH STREET - LAFAYETTE, INDIANA

Manufacturers of the Steering Gears that Predominate on Motor Trucks

When Writing, Please Say—"Saw Your Ad. in the CCJ"

"B" and 6 in. deep, 3 in. wide and 7-32 in. thick on model "A." Springs are semi-elliptic, 2½ x 37 in. front, with 7 leaves, and 2½ x 52 in. rear with 10 leaves on the one tonner, and 2½ x 9 in. in front, with 9 leaves, and 3 x 52 in. rear, with 12 leaves, on the two-tonner. Wheels are fitted with 2-in. oval spokes and Firestone rims. On the 1-ton model the wheels are fitted with Firestone 36 x 5-in. tires, while on the 2-ton model "A" they measure 36 x 4 in. front and 36 x 4 in. dual rear. The wheelbase on the smaller model is 130 in., while on the larger truck it is optional, 145 or 170 in. Equipment includes three oil lamps, mechanical horn, jack, oil can, tool box and tool roll with special wrenches. The price of the model "A" two-ton truck is $2400, while that of the model "B" one-ton is $1750.

Overhead-Valve Engine in New One-and-a-Quarter-Ton Koehler

COMBINING advanced modern methods of construction, high quality materials, durability and uncommon service features, the 1918 Koehler truck offers what the makers, the H. J. Koehler Motors Corp., Newark, N. J., believe to be one of the most complete units in the 1¼-ton field. The chassis price is $1150.

The Koehler engine is a four-cylinder, water-cooled, valve-in-head type. The cylinders are cast in block, integral with the water jackets. The bore is 3½ in. and the stroke 5 in., having a rating of 19.6 by the S. A. E. formula.

The cylinder head is a separate casting with a generous water outlet at the forward end, the valve ports and the combustion heads being cooled by large water chambers. There are six water passages from the cylinder block to the head—three at either side.

The crankcase is in two sections, the upper half being cast with a transverse vertical web at the center that carries the three main bearings. The lower section contains the oil reservoir, which is separated from the crank chamber by a horizontal partition in which are oil troughs.

The cylinder block castings are of high grade gray iron. Pistons are cast from the same metal as the cylinders and are turned and ground to exact size, being channeled for three diagonally split compression rings.

The crankshaft is supported in three large main bearings, 2-in. diameter each, and is of special alloy steel. Crankshaft bearings are bronze shells lined with high quality babbitt metal. The camshaft is a three-bearing type, constructed of a special steel drop forging, that is formed with the cams integral.

Valves are made by the Schlieder process, with heads and stems of nickel steel and interchangeable. They are actuated by rocker arms carried on supports on the top of the head and tempered helical springs. The engine head is enclosed by a cover plate that is easily removable, so that there is unusual accessibility and yet full protection to the valve mechanism.

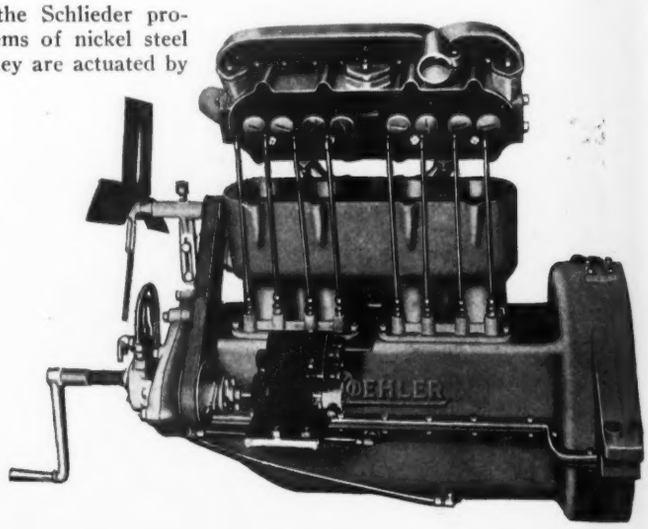
A special model of the Stromberg carburetor is used, giving greater efficiency.

Lubrication of the engine is by a combination pressure and splash system. The oil is drawn from the reservoir in the engine base and circulated by a pump-driven by the camshaft and forced through a strainer to the main bearings and the timing gearset case. Oil is distributed by splash to the cylinders, pistons, wristpins, connecting-rod and camshaft bearings and the valve tappets and cams.

The engine is cooled by thermo-syphon circulation of the water through the engine jacket and a large vertical tube radiator that is constructed with cast top and bottom tanks. The radiator is carried between springs mounted on side frame members of the chassis, and is protected against chassis distortion stresses. Ignition is by an Eisemann high tension magneto.

The clutch and the transmission gearset are assembled in unit with the engine and mounted at three points on the chassis frame, the rear supports being integral with the flywheel housing.

Power is transmitted through a large tubular shaft with universal joints at either end, to the Torbensen internal gear-driven rear axle.



Left-Hand Side View of the Koehler Overhead-Valve Engine With the Cylinder Head Removed.

The New One-and-a-Quarter-Ton Koehler Truck Fitted With Flareboard, Cab-Top Body

The front axle is a heavy I-beam section type; the steel frame is channel section, with three cross members. Springs are semi-elliptic and of "graded" type, 38 in. long front and 46 in. long at the rear. The wheels are wood, artillery type, 14 spokes, with 34 x 3-in. tires forward and 34 x 4-in. rear. The wheelbase is 129 in. and the tread standard 56 in. External contracting service and internal expanding emergency brakes are direct on the rear wheels.

The chassis is regularly equipped with front fenders, driver's seat fitted with lazy back, oil dash, tail lamps, mechanical horn, kit of tools, etc. The chassis will take a body approximately 48 in. wide between rear wheels and 108 in. or more in length. The price of the chassis complete is $1150, f.o.b. Newark, N. J.

RACINE MOTOR TRUCK CO., Racine, Wis., organized to manufacture Reliance trucks, will erect a complete new factory in which to manufacture the Piggins internal spur-gear drive rear axle, which is incorporated in the Reliance truck, on a commercial basis. C. R. Piggins is chief engineer of the company.

Why is the CCJ the only truck paper a member of the Audit Bureau of Circulations? Here's food for thought

Lessons of the War

AS in the early days of the Vanderbilt Cup, when the gigantic strain of racing brought forth the need of the modern high speed steels for motor car construction—so in the colossal requirements of war, the truck needs of industry are emphasized.

It is significant therefore that in every department of war where the motor truck is utilized, just as in every important industry, the Velie is rendering big service — efficient, dependable and at low operating cost.

The Velie meets the requirements of war with an ample margin of surplus power and reliability —in the hauling of goods, transportation of men, construction work on cantonments and in the ambulance service.

These high spots in the specifications tell a convincing story: Heavy Duty Continental Motor; Worm Gear Drive; Timken Bearings throughout; Steel Raybestos Disc Clutch; Nickel Chrome and Vanadium Steel Construction. 1½-2 Tons Capacity, $2750; 3½-4 Tons, $3600.

Write today for booklets and complete particulars. The Velie truck serves your government faithfully and will serve you equally well.

VELIE MOTORS CORPORATION
119 Velie Place MOLINE, ILLINOIS
Builders of Automobiles, Motor Trucks and Tractors

Velie Trucks WORM GEAR DRIVE

Largest Garage in the State of Maryland

By LOUIS KRAKOW

TO move an automobile from the front of a four-story garage into position on the third floor in exactly 30 seconds, and, furthermore, immediately one car has commenced its upward journey to its abiding place, to follow same with another in its wheel tracks may seem to be an impossible task, but this is precisely what can be done at the Mid-City Garage, 27-31 S. Charles St., Baltimore, Md. All delay, all waiting, all congestion has been eliminated.

It is needless to say that a car could not be moved from the first floor of a four-story garage into position on the third floor through the use of elevators, and in such record time. Hence the customary elevators have been omitted. In their place there is a gently sloping incline, or ramp, as it is technically known. This ramp extends from the first floor, at an incline of 10 per cent., to a landing on the second floor, from which it continues, at the same grade, to the third floor. This ramp is broad enough and the grade gentle enough to permit of an average speed of 15 m.p.h., up or down.

The total storage capacity of the garage is about 500 cars. The company does both a night and day storage business, on similar plans to that conducted by the Euclid Square Garage, in Cleveland, Ohio. The limit of time allowed to clear the building of the 250 cars on night storage and receive the 250 cars on day storage does not exceed 4 hours in the morning or from 6 to 8 o'clock for the outgoing cars and from 8 to 10 o'clock for the incoming cars. This operation is repeated in the evening, the day cars leaving the building from 4 to 6 o'clock and the night cars entering again from 6 to 8 o'clock. It will therefore appear that provision must be made for 500 cars to enter and 500 cars to leave the building in a total time limit of 4 hours each. To obtain this facility of ingress and egress would require at least six elevators. The ramp has made five of these unnecessary—one being maintained to carry disabled cars to the shop located on the fourth floor.

Modern Features Throughout

Another novel feature embodied in this most modern and up-to-date garage, is the operation of the large entrance doors to the building. These may be opened and closed by an electric motor, controlled by a switch located in the checker's office just inside the entrance.

An automatic gasoline system delivers gas on the first, second and third floors. Draw-off stations are located near the entrance to each floor, so that cars can be filled either directly or by means of portable tanks. Gasoline is obtained from a battery of five 10-barrel tanks buried under the sidewalk in front of the building, giving a total storage capacity of 2750 gal. These tanks are filled through a plug in the street and are so interconnected that by means of valves, provided for the purpose, all the tanks may be drawn from simultaneously.

The building is so located that light is obtained on three sides. Advantage is taken of this fact by placing as many windows as possible in the building. In addition to this the electric lighting arrangements have been carefully installed. Hot and cold water is supplied throughout the building.

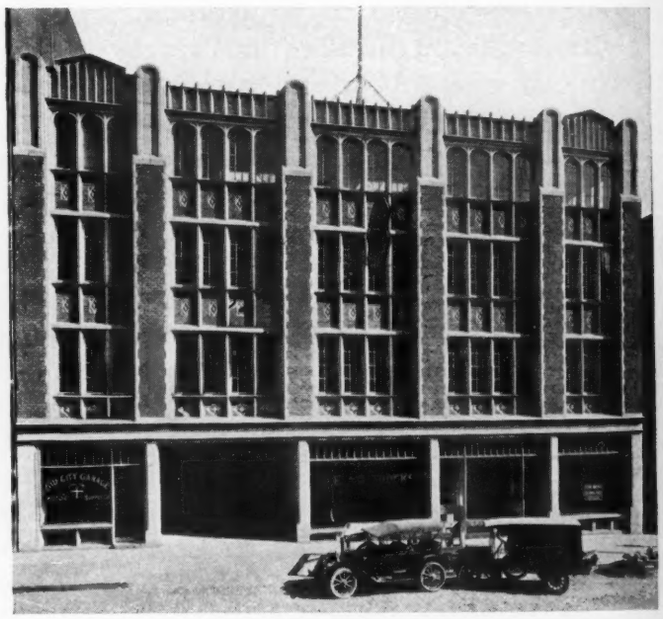
On the first floor, to the left of the entrance drive, is located the accessory salesroom and office, having a frontage on Charles Street of 16 ft. and a depth of 30 ft. Behind this space is located a stairway giving access to all floors of the building. The car entrance is 18 ft. wide, giving ample space for two cars to pass. Beginning to the right of the entrance drive and continuing the remaining 50 ft. of the Charles Street front are two attractive salesrooms, both with a depth of 55 ft. and a frontage of 22 ft. The company is the Baltimore agent for D-E worm drive trucks.

The company has established a very unique system by which it endeavors to give quick, efficient service in its other branches of the business. It has devised a system of coupon books for the elimination, to the greatest possible extent, of the overhead cost. The purpose in doing so was to give the concern's customers the benefit of such saving. This is done by selling supplies and accessories at as close a margin as possible and by spending more than is usual in equipment and labor to render the high-grade service that the company has established. So long as the company can continue to make this saving in operation it can continue to give its customers these advantages. In establishing the coupon book system the concern has established a system by which it and the customer work in closer co-operation. No matter what latent advantages may exist in such a system, it cannot be successful if it does not prove effective. And there are many advantages to the customer in this system. For example:

1. It allows the customer an additional discount of 5 per cent. from the already established standard price.

2. It keeps an absolute record of the cost of operation for each car and truck.

3. It affords the customer a means of providing his driver or drivers with the authority to purchase for his account without giving them a cent of money.



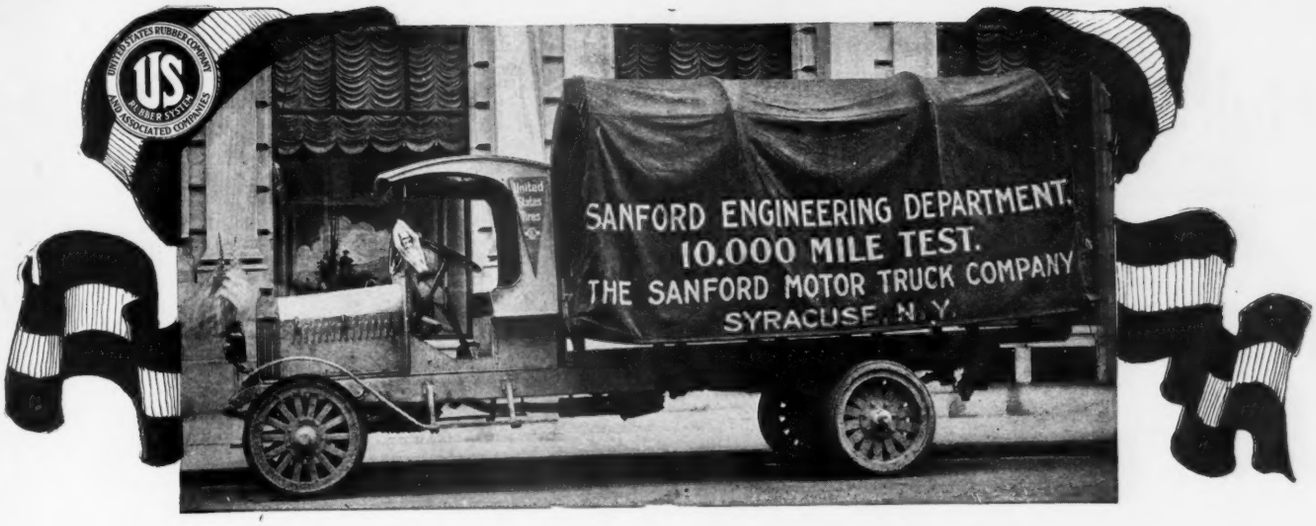
The Front of the Mid-City, the Largest Garage in Maryland, Which is Located at 27-31 S. Charles Street, Baltimore.

4. It affords the customer a means of automatically settling his accounts without the necessity of constantly stopping to make payment.

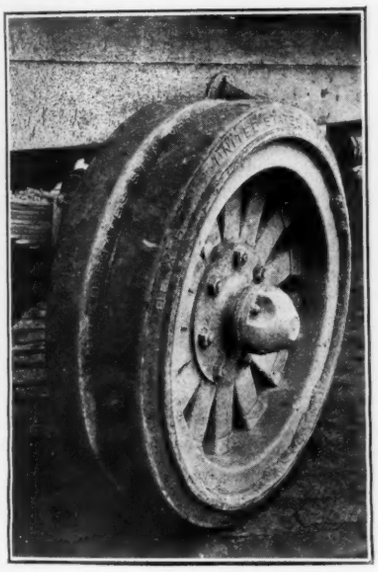
The company sells the coupon books, which are worth $10, to the customers for $9.50.

The officers of the Mid-City Garage and Motor Supply Co. are: John W. Frick, president; Horace Slingluff, Jr., vice-president and general manager; Maurice H. Grape, secretary and treasurer. The directors are as follows: Charles T. Crane, Maurice H. Grape, Frederick W. Gottlieb, Charles J. Bolgiano, John W. Frick, Ral Parr, William A. Pierson, William Keyser, Jr., and Horace Slingluff, Jr.

WM. F. MURRAY, postmaster of Boston, has completed his plans for a complete mobilization of the Boston Postoffice. A garage has been erected in South Boston to take care of the vehicles the Government will operate. The garage will be under Federal supervision and the drivers, repairmen and other workers will be on the payroll of the United States.



Another Remarkable Performance of United States Solid Truck Tires

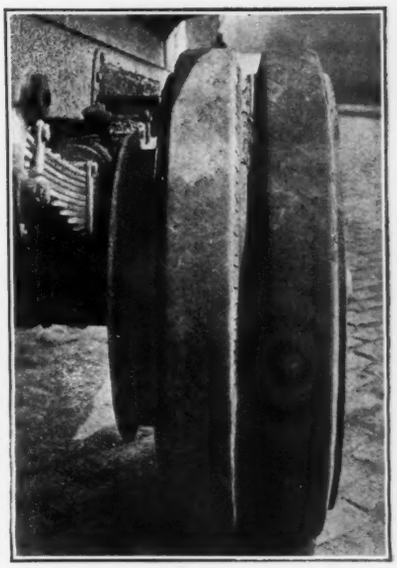


has come to light in the 10,000-mile test run of a Sanford motor truck.

At the end of 5,000 miles the tires showed absolutely no wear, as will be seen by the accompanying true photographs, with the exception of a few minor stone bruises.

The Service Manager of the Engineering Department of the Sanford Motor Truck Company of Syracuse, J. A. Nolan, drove a 3½-ton truck from Syracuse to Buffalo, and then on by a devious route to Pittsburgh, Baltimore, Philadelphia and New York. This truck, built on approximate army specifications, was equipped with 36 x 5 single front and dual rear pressed-on United States tires.

This is what Mr. Nolan said of the trip after covering 5,000 miles, or the first half of his trip:



"My orders from the factory were 'Shake it apart. Break it up if you can.' And I took them at their word and tried my best to follow instructions. I gave the truck the very hardest run I could—the severest test that I've ever given a truck—and I've been testing trucks for over nine years. Stop or slow up at ruts, bumps or railroad tracks? Not once! I took them at full speed ahead. And the hills that I slid down with all brakes on! You should have seen some of them in the Allegheny and Cumberland Mountains 2,900 feet high. Mud? Why, on that strip of road between Pittsburgh and Silver Creek, the rear wheels were actually our of sight at times. Loose gravel and soft laid stones? We paid no attention to them for we had orders to wreck the tires as well as the truck—if we could.

"The road conditions we met and the punishment I gave the tires certainly warrant that they should show some wear, but I see no difference in their size from what they were on the day we left. In all my nine years of testing trucks I've never seen tires in such perfect condition at the end of even 1,000 miles. And I used these same tires on the same truck on shorter test runs before I started on my big trip.

"In spite of the fact that the truck itself is designed with the idea of giving the best balance possible to the tires, I fully expected to see at least more wear in spots, especially after the way I took the down grades on the hills we went over. And you know that this down-hill skidding is the hardest test in the world for a tire."

United States Tire Company

1790 Broadway New York

When Writing, Please Say—"Saw Your Ad. in the CCJ"

Making Over a Money-Losing Department*

This "Black Sheep" Department Was Wasting the Profits Earned Elsewhere Until the Methods Described Below Turned It Into a Profit-Maker

By CHARLES J. GEORGE

FIVE years ago we started business with a total of three employees. Now we number sixty-three and are still growing. As our growth was fast from the start, we devoted very little study to the finer details of the business. We knew that our profits came from the sales of automobiles and supplies and that our repair shop was absorbing some of these profits. We counted our loss in the repair department as a necessary expense to the promotion of sales and so tried to forget it. But month after month this loss increased, and after an investigation we put in our present shop system. Now, instead of losing money, we are making a substantial profit on our repair department.

In planning our system "red tape" was conscientiously avoided and only records giving practical and useful information were adopted.

Cost of Repairs Approximated

When a customer drives up to our place of business to have his car repaired he is met by our service man, who inspects not only that part of the car called to his attention, but other parts as well. Although an accommodation to the customer, this results in considerable additional business.

After the inspection a shop repair order is made out. This form is composed of three copies printed on both sides. The first two copies are alike on both front and back. The third sheet is made of cardboard. The service man uses carbon and writes the order in triplicate. The repair operations are written separately, with the proper labor charge after each one. In this way the customer knows in advance how much he must pay for the labor.

A claim check and jogger card are made out together. The claim check is given to the customer; and the jogger card, with the original and duplicate sheets of the repair order, is sent to the cashier in the office, who pins the two sheets together and holds them in numerical order. The cardboard copy is sent with the car to the repair shop, where it is turned over to the shop foreman, who gives it to the workman put on the job. The workman uses the back of this card to record the time he spends on each operation.

A daily time report card for each workman, who gives it to the workman put on are required to report whenever they change jobs. This form is kept primarily to distinguish between profitable and unprofitable labor.

*Reprinted from the September issue of *System*.

Material used on repair jobs can be secured only by presenting a requisition to the clerk in charge of the stockroom. The clerk here, after he delivers the material to the workman, writes the prices opposite the names of the articles on the requisition, puts his number in the space provided and sends the requisition to the cashier to be posted to the original and duplicate of the repair order.

Shortly before the time a job is promised the cashier refers to her jogger cards. These are filed before her according to the time the jobs are promised. She calls up the repair shop and asks about the progress of that particular job. We have found that this attention from someone not connected with the repair department is a big help in gettings the jobs completed at the promised time.

When a job is finished the workman reports to the shop foreman. The latter inspects the car and turns the repair order card in to the tool room. The shop clerk stamps the card "finished" and sends it by carrier to the cashier. She totals the labor charges, removes the original and duplicate copies from the file, totals the material charges, enters the labor charges, and makes a grand total. The three copies of the shop repair order are then held together until the customer calls for his car. When he arrives and pays his bill the duplicate of the shop repair order is given as a receipt. The cashier then telephones the shop to send the car, which is delivered upon presentation of the receipt.

Care of the Workmen's Tools

Each shop workman has assigned to him a box containing the tools he is likely to need. These boxes are turned in at the tool room every night. If a special tool not included in the assortment is needed, a workman may get it from the tool room by giving in exchange a small brass check stamped with his number. This check is hung on a hook in the bin from which the tool was removed and is given back to the workman when the tool is returned. We keep a perpetual inventory of all the tools. This enables us to keep an accurate check on all our tools and saves considerable time and money.

Costs are figured each morning on all the repair jobs turned out the day before. We use the percentage on wages method. We have established a regular scale of repair prices and tell each customer before the job is started the amount he will be charged for labor. We have found this plan particularly advantageous. Our shop foreman and also the workmen know that if they do there work quicker the profits will be greater. They can see where their efforts will be of direct aid to the company. However, when there is a fixed charge per hour for labor, the workman cannot see any great advantage in hurrying, and naturally feels that no matter how much he hurries the profits will be no greater. He simply feels that the sooner the job is done the less the customer will have to pay. This, of course, makes the company's profit less in the long run.

Men Keep Jobs Moving

Each day after the shop repair order cards have been totaled, the cost figured and the profit or loss shown on them, they are sent to the shop foreman, who uses them in reviewing the work of the day before. He can immediately locate any lagging on the part of the workmen. The workmen know this and when they are forced, through no fault of their own, to spend an unusually long time on a job, they generally explain the circumstances to the foreman even before he has an opportunity to see the record of their time and ask for an explanation.

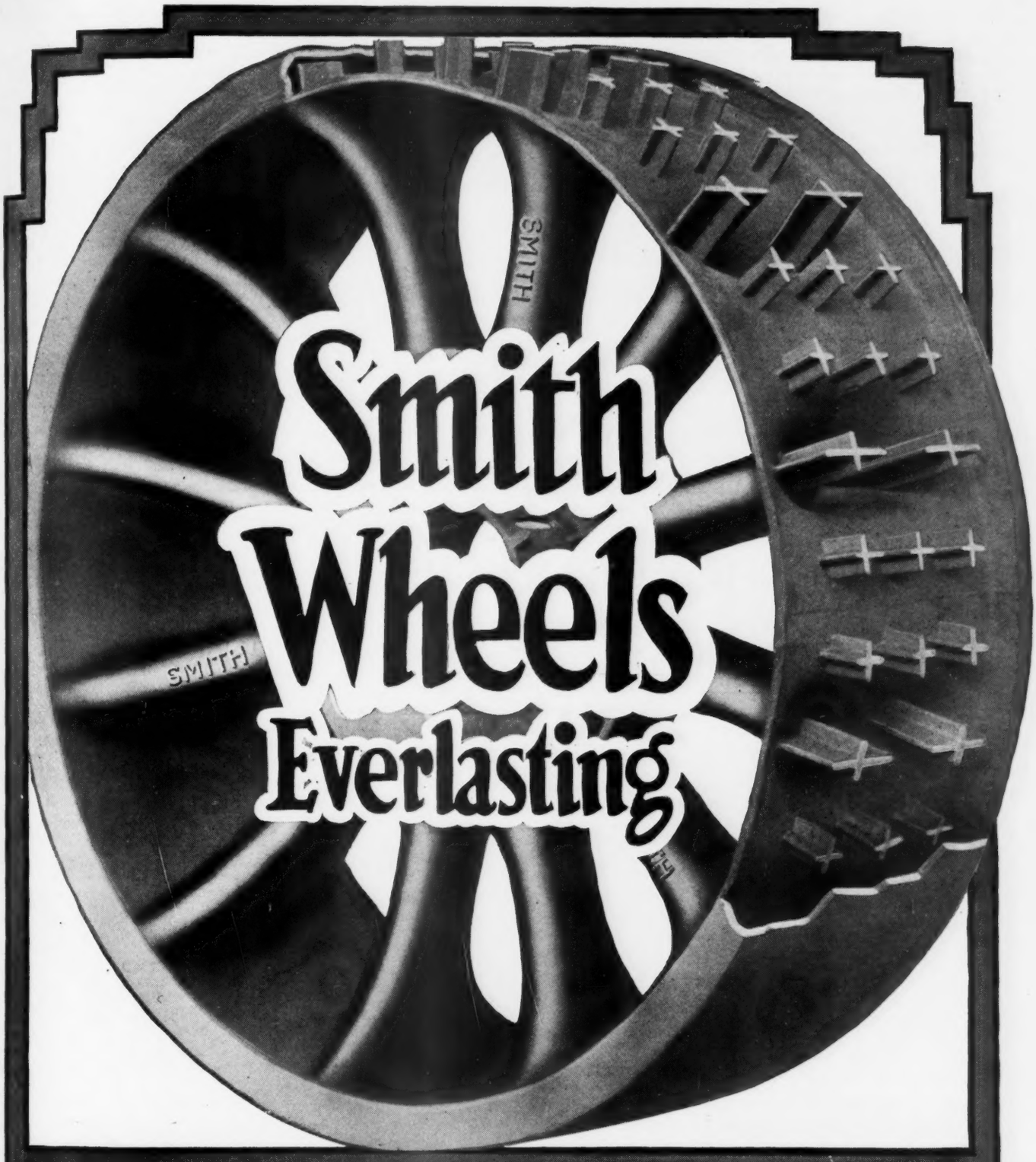
By watching the workman's time and the profits on the jobs the foreman knows how to distribute work among the men to the best advantage. He knows the kind of work for which each man is best fitted. The result is, our workmen have become specialists in this work and we get the maximum earning power out of each man.

We use several plans to keep the men interested in the business. A year ago we put in a profit-sharing plan. The results so far have been very satisfactory. Each man receives only a regular weekly salary equal to the amount ordinarily paid for his class of work until the end of the year. If the records show that he had personally interested himself in the business and exerted extra efforts in his work he is paid a certain share of the annual profits.

The amount of the share is determined by the extent of his extra efforts and the amount of profits earned in his department. As each shop man comes under the direct supervision of two people, the shop foreman and the captain of his service shift, it is easy for us to tell who is doing the best work.

One of the duties of both the service shift captain and the shop foreman is to make a study of the individuals under their supervision. Every month they turn in a detailed report of each workman, making note of the man's progress, the spirit in which he does his work, his good qualities, his bad qualities, and any other facts that might be

The CCJ is built upon the lasting foundation of honest circulation



SMITH WHEELS SAVE YOU MONEY!

$200 to $500 a Year on Each Truck of 1½ Tons Capacity and Upwards

Tire Mileage Increased! Gasoline Mileage Increased! Truck Life Increased!

Smith Wheels Guaranteed DURING LIFE OF TRUCK on which originally placed

INSIST ON "SMITH WHEELS" ON THE NEXT TRUCK YOU BUY!

SMITH WHEEL INC., SYRACUSE, N. Y., U. S. A.

used for the betterment of the individual. We consider these reports very valuable, particularly because each workman is studied by two department heads and from two different points of view. We are given a chance to understand our men, to try and correct their faults, and to advance them judiciously. The service shift captain often helps the foreman with a man who is giving trouble. Not being connected with the shop and having but a few men under him, he can talk freely.

Another plan which has been of considerable value to us is our "shop efficiency contest." Every month a clean sheet containing the names of the shop workmen is posted on the bulletin board. When a workman violates one of the contest rules a certain number of black marks—the number varies with the seriousness of the error—is placed after his name.

Every man completing the contest period without having any black marks receives a gold badge—or a gold bar to attach to his badge—if he has already won a badge. If no one has a perfect score, a silver badge is awarded to the man having the fewest black marks, providing the number does not exceed five. Any man receiving more than ten black marks during the contest period is suspended for a time. Black marks are given for:

1. Failure to properly check in at tool room or on a repair tag.
2. Not putting box in tool room at night (box must be in 30 minutes after man checks off from work.)
3. Not turning in checks to tool room at night.
4. Not turning in borrowed tools at tool room at night.
5. Leaving tool boxes out at night.
6. Using another man's tools without the foreman's permission (this is permissible, however, if the man whose tools you are using is working on the same job.)
7. Working on car improperly lined up.
8. Not putting clothes on rack properly or failure to button curtain when finished with rack.
9. Leaving trash on job after checking off (last man checking off is responsible.)
10. Throwing or leaving trash on floor, any time.
11. Losing repair tag.
12. Slighting work on job.
13. Checking in late morning or noon.
14. Cursing or using other objectionable language.
15. Numbering requisition wrongly.

The workmen show a great interest in these contests and the monthly average of black marks per man has steadily decreased. We have found that the men become more careful, not only in those things for which they are liable to receive black marks, but in all their work.

With the idea of keeping up the enthusiasm of the shop workmen, as well as the others of the organization, a meeting is held once a week. "Ginger up" talks are given by the department heads and many of the shop men make short talks. Enthusiasm prevails from start to finish.

Co-operation of our employees, coupled with records that show us leaks, is responsible for our success. We are now being forced to double our present quarters.

Government-Owned Trucks Handle Mail at Buffalo

By GEORGE W. GRUPP

THE natural conclusion for the onlooker is that Uncle Sam owns and operates a large fleet of motor trucks in his mail and parcel post delivery service. But the truth is that he owned but few until recently. The trucks were owned by contractors who had to conform with Uncle Sam's specifications in every detail so that they looked like his property.

From present indications this state of affairs is not to exist much longer. Some years ago a special committee was appointed to investigate the relative cost of purchase and rental of trucks. One report to the Department read in part as follows: "While this inquiry is by no means completed, it has gone far enough to indicate that the department can own and operate its own vehicles at a less cost than has been the rule under the rental system."

"The rental of supplies by a government department is not only wrong in principle, but invites abuse, is often attended by scandal, is unbusinesslike, and generally wasteful. It is the belief of those who have looked into the matter in the Post Office Department that thousands of dollars annually can be saved in the postal service by the purchase of supplies rather than rental under the contract system."

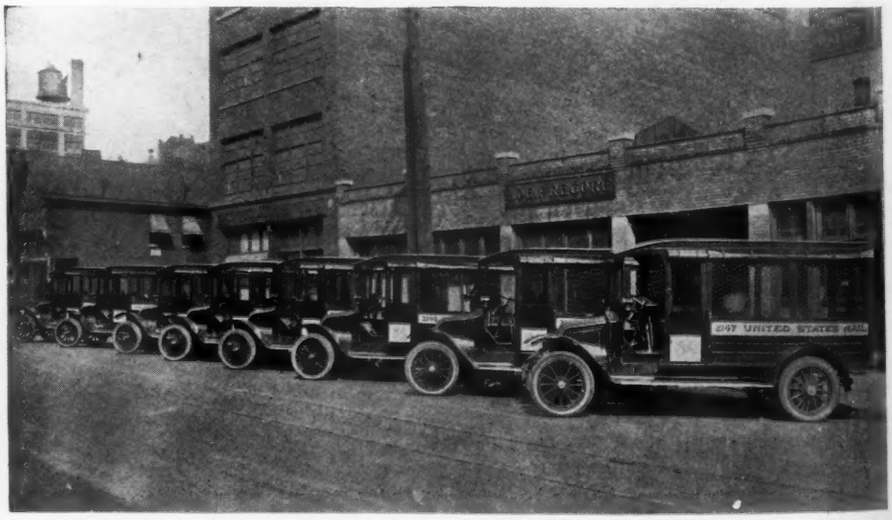
The outcome of this investigation was the purchase of forty-one motor trucks in 1914. Another committee was appointed for the purpose of preparing new specifications, etc., based upon a year's experience with these trucks.

Under the contract system a great deal of dissatisfaction was encountered. Contractors would go to considerable, even unnecessary, expense at times in building their unit which of course had to be borne by the department. Then on the other hand an injustice is and was done to the contractors, in that the government experts often rejected a delivery on purely technical grounds, not for practical reasons. This again means that the department had to foot the bill as the contractors would increase their prices.

All of this caused the investigators for the department to recommend to the government that it buy motor trucks as rapidly as the present contracts expired.

Buffalo, N. Y., is one of the first centers in which the postal delivery service has been completely motorized by government owned trucks. On August 15, 1917, a fleet of eighteen 1000-lb. Fords, eight 1500-lb. Lippard-Stewarts, and two 2500-lb. Brockways replaced a fleet of contracted motor and horse vehicles.

"The Fords," said Postmaster George Meyer, "are being used for our parcel post service and mail collecting service for the



Lippard-Stewarts Installed by Uncle Sam in the Buffalo, N. Y., Post-Office Department

This suggestion, though of some years standing, has at last been given real consideration by the department, as the government has entered into a contract with a number of truck manufacturers to supply the department with trucks at a given price as they need them to replace contracted trucks and horse driven vehicles.

outlying districts of the city, while the Lippard-Stewarts and Brockways are being used for hauling mail to and from the trains and to and from the sub-station post offices to the main post office.

"The little experience which we have had with our newly acquired outfit has been entirely satisfactory and gratifying."

Make your product pay—advertise in the CCJ

ATTERBURY

The Truck That Sells and Serves

A truck that sells on its reputation—on appearance, on specifications, on size, power, ability—on demonstration, on the record of actual performances in the hands of present users. The Atterbury sells so easily and surely that it is a revelation to every new dealer who takes it on.

For thirteen years we have been making good trucks. Few builders have been in this industry so long. Each Atterbury truck has represented the best of contemporary standards in truck construction.

This company has never risked the pitfalls of great quantity production. It has endeavored to maintain 100% Atterbury quality in every vehicle produced.

When you are in the market for a motor truck, or looking for a truck dealership, you will investigate the Atterbury, in justice to yourself.

Full details on request

THE ATTERBURY MOTOR CAR CO., Buffalo, N. Y.

Motor Truck Equipment Benefits the Farmers

THE American farm is face to face with a stern necessity. The farm must be put upon a business basis and the farm's affairs must be administered in a business-like manner. Hit-or-miss methods and inefficiency must go. To put a profit in the farm account those principles must be followed that have proved essential in any manufacturing activity, because inherently, the farm is a manufacturing organization. Foremost among all the conditions that are making the old methods of farming unprofitable, is the unprecedented shortage of labor. The cost of farm labor has never before been so high. There has never before been so few available hands and those who are obtainable do not, as a rule, measure up to a high standard.

One of the first measures for putting the farm on a business basis is the installation of up-to-date labor saving and time-saving machinery. Rapidly coming to the front among such mechanical equipment is the motor truck.

In the Northwest the farmer has taken to the motor truck as the means of saving him thousands of dollars, and last season there were more of these labor-saving machines introduced in this section of the country than ever before, and we believe this season will see even a greater increase, for it has been proven conclusively that the motor truck pays many times its cost in a very short time.

Interesting demonstration in the wheat fields on Asotin Prairie, above Snake River, in eastern Washington, were made last summer with a 2-ton truck and trailer. The truck, with its trailer, hauled a load of 85 sacks of blue barley from No. 21 Ranch to Tammany, covering a distance of 12 miles in 1 hour, ½ of the distance being through soft stubble fields. The weight of the load was 2½ times the capacity of the truck, or 10,152 lb. The round trip was made in 3 hours, including the delay in loading and unloading, and at a total cost of $3.22, or a cost per sack of 3¾ cents. A previous record over the same haul and with horses showed a cost per sack of exactly 8 cents.

Another demonstration held last season in eastern Washington, which attracted more than usual attention was that given by Mrs. Nels Truedson, who operates a 1000-acre wheat farm, near Sprague. Wash. 24 tons of wheat were moved from the farm to Sprague in 11 hours, over a distance of 17 miles for the round trip or a total of 136 miles. The total number of bushels moved was 828. The road laid over four grades, averaging from 5 to 8½ per cent. and ½-mile in length. The 2-ton truck used in the demonstration consumed 19 gal. of gasoline and 1 gal. of oil during the performance of the test.

Again, a 3½-ton truck, purchased by Reinbolt Bros., wheat farmers, located about 21 miles north of Davenport, Wash., who were compelled to haul their wheat to that point, also attracted considerable attention. Over the hilly roads of this section, where one of the grades runs as high as 18 per cent., the performance of the motor truck was considered remarkable through the fact that 72 sacks of wheat were loaded onto the truck in the field, pulled through the field from which the wheat had just been cut and the ground was soft. Two round trips, covering a distance of 84 miles and delivering 312 bushels of wheat in 9½ hours was made. The fuel consumption for the test was 19 gal. of gasoline and 1 gal. of lubricating oil.

At Colfax, Wash., a 2-ton truck was loaded with 3 tons of wheat from the separator in the field, pulled through the medium soft ground to the county road over a 7 per cent. grade and delivered its load at the warehouse at the railroad many miles away.

Mr. Henry Hickman, of Colfax, Wash., has a haul of 4 miles to the warehouse, 2 miles of which has a grade ranging from 10 to 20 per cent., and a drop in altitude over this 4 miles reaches the remarkable figure of 1250 ft. The truck, which was in service last summer, and which Mr. Hickman expects to put in service the coming year, takes down 45 sacks in 35 minutes and returns in 40 minutes, making the major portion of the trip on second and third gear. Under the present road and climatic conditions it would require a 4-horse team no less than 2½ hours to accomplish the grade on the return trip with an empty wagon. This truck was driven on a double shift of 10 hours each or a total of 20 hours per day.

The Economical Way for Farmers to Handle Light, Bulky Loads—the Semi-Trailer

When one considers all these examples of truck performance, that the weight of the average sack of wheat runs from 130 lb. and over, it can be seen how much each one of these trucks hauled and what the saving was to the farmer.

Another enthusiastic truck user in eastern Washington reports that he drove a 2-ton truck 145 miles—72½ miles the truck being loaded. He made five round trips—each trip being 29 miles. The total hours from start to finish, counting 2 hours out for meals, was 13. The total number of tons hauled was 15, and the total number of bushels of wheat hauled was 522. The total gasoline consumed was 20 gal. and the lubricating oil was 3 qts. There were three grades on the trip that averaged between 10 and 11 per cent. and 2 grades of 7½ per cent. At no time on the entire test did they use low gear except to make the start in each case.

The farmer has been converted to the motor truck and they are now fast friends. Of that there can be no question. It remains for him to select the truck suitable for his particular requirements, and that entails the study of his conditions by a truck expert who has a thorough knowledge as to how to solve his problem, and is capable of analyzing them intelligently.

This Illustration Shows a Two-Ton Truck Hauling Wheat for a Woman Who Operates a Thousand Acre Wheat Farm Near Sprague, Wash.

A. R. MOSLER & Co., New York City, has been awarded a contract for all the spark plugs to be used in the motor vehicles of the American Expeditionary Forces.

Advertising appropriations bring greatest returns when expended in the CCJ

POLACK TYRES

OUR
10,000 MILE
GUARANTEE
IS A CONSERVATIVE ESTIMATE
OF
POLACK TYRE
SERVICE

Class & Nachod Brewing Company Philadelphia, say:

"**** We find your European tyres to be the greatest rubber product on the market.

We get more than the allotted mileage out of each and every tyre that we use on our five trucks ****."

POLACK TYRE & RUBBER CO.
NEW YORK

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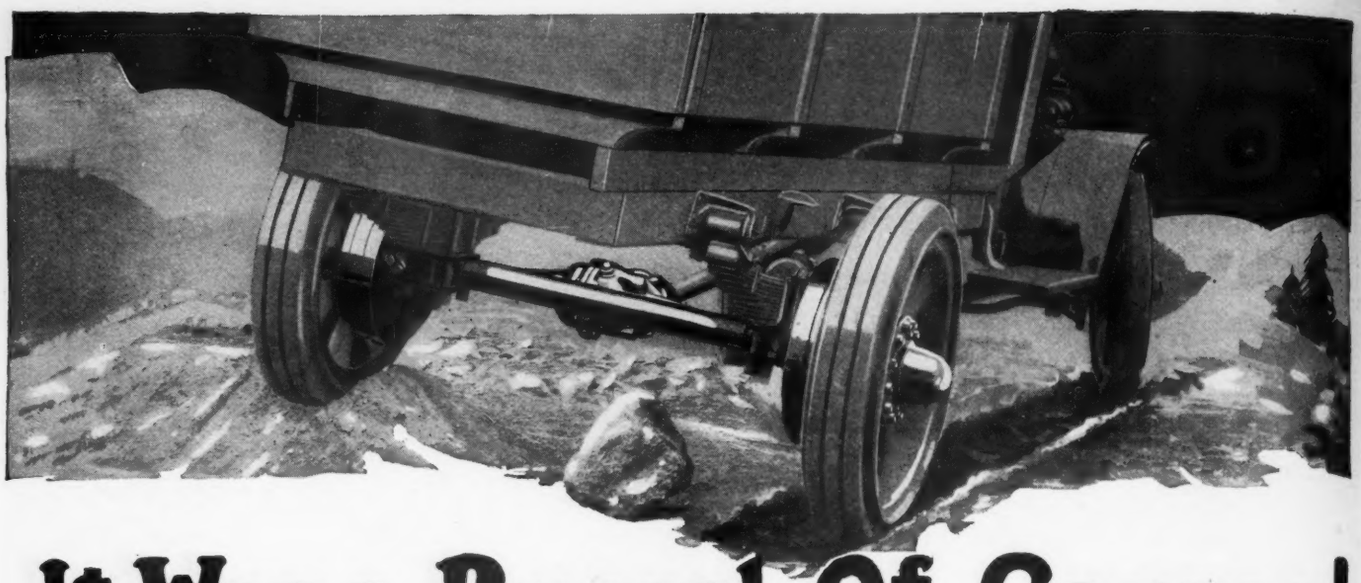


It Was a Russel, Of Course!

Blue Ribbon Indorsement

One of the most valuable constructional features of your axle is the complete separation of the jackshaft from the load member, leaving it free to perform its function, without loss of efficiency from strains transmitted from the dead axle.

Chief Engineer,
Denby Motor Truck Company.

The Russel Internal Gear Drive Axle is the first shaft drive unit in which the driving axle is *wholly* separate from the load carrying axle.

Hence, strains of load or twist, to which the load member is inevitably subjected, are not transmitted to the driving axle in the slightest degree.

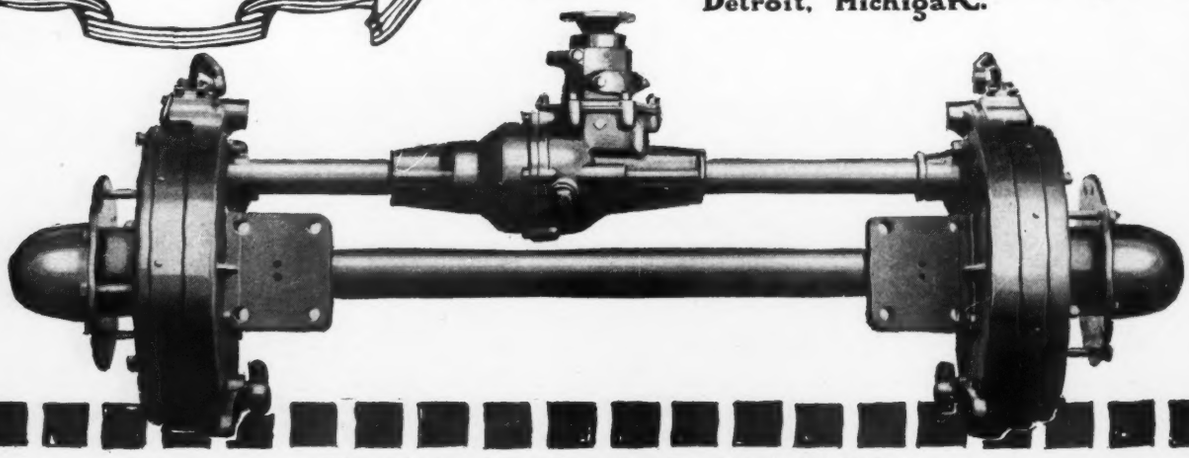
This not only increases the life of these parts, but also prevents strain and loss of power through disalignments.

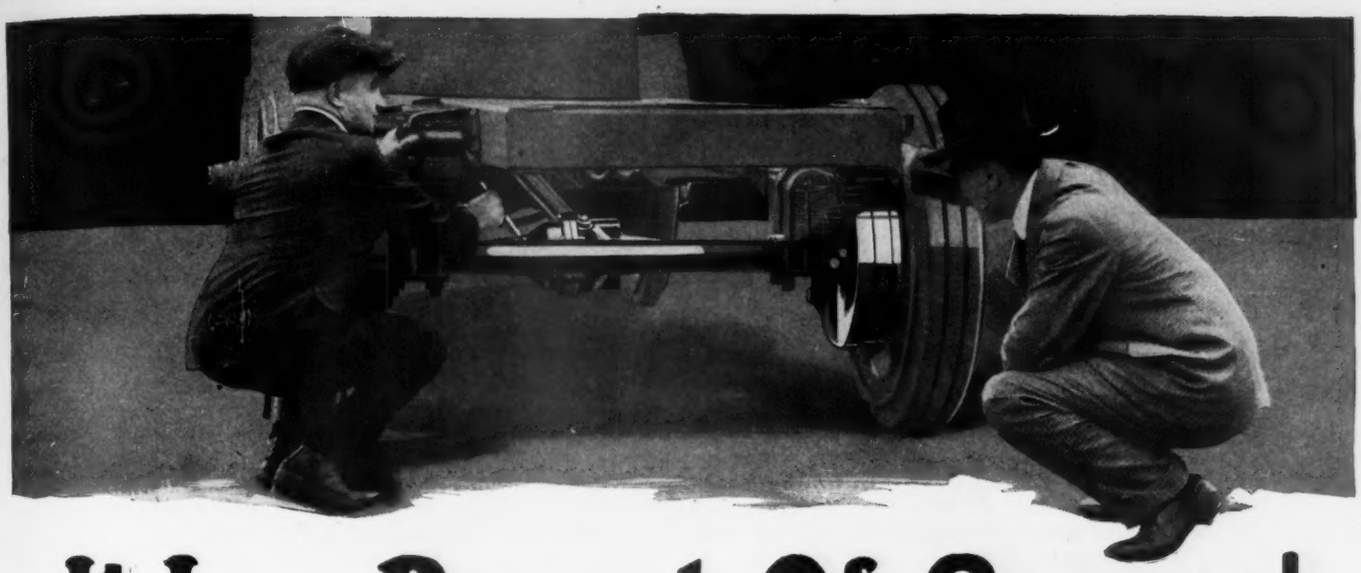
"I DIDN'T think it could be done," said the Star Route Man. "Didn't think it possible for any piece of mechanism to stand the jars and twists and strains of our Colorado trails.

"But, say! I've been driving the truck over a year now, and that axle is just as sound and reliable as the day I bought it. What the salesman told me about the advantages of having the load carried on a solid round bar of steel, with an entirely separate axle to do the driving, surely proved itself in my case."

In every branch of motor-haulage, under every condition of operation, the Russel internal-gear axle is today demonstrating a complete mastery of load and road.

Russel Motor Axle Company
Detroit, Michigan.





It Is a Russel, Of Course!

WHEREVER there is hard work to do, wherever a little *extra* ability is needed, wherever economy of fuel and tires is desired, wherever performance is considered, there the Russel Internal Gear Drive Axle is the feature that supplies the clinching argument.

The Russel idea, in both design and construction, means performance and economy in operation and maintenance.

Russel Advertising and Dealer Helps show you just how to prove this to the buyer. They talk to him in his own terms. They help you to sell him *better haulage*, not merely a mechanism for transporting merchandise.

You will find Russel equipped trucks easier to sell and easier to keep sold.

Russel Motor Axle Company
Detroit, Michigan.

Blue Ribbon Features

Load carried on round, straight axle capable of meeting every strain.

Separate driving axle, so mounted that twists of roughest roads do not affect it.

Strain on driving parts very low, giving long life.

Extremely easy on tires.

Maximum road clearance.

Very large brakes.

No delicate or complicated parts.

Easily cared for.

Average load on wheel bearings ½ to ⅓ what they are on other types.

Not sensitive to slight misadjustments or variations of lubrication.

High efficiency under all conditions of road or load.

If you want facts, you will want to read "The Final Question," a discussion of all forms of final drive. We will send it gladly.

Russel
Internal Gear Drive Axles

CHILTON TRACTOR JOURNAL

The Proper Way of Distributing Tractors

[This article is written expressly for the motor car dealers and tractor manufacturers who are in doubt as to the most profitable and desirable way of distributing tractors. Read it carefully, as it contains certain criticism of the work done so far. Then read the letters on the pages following. If you take exception to our views, please write us and give your frank opinion.—Editor.]

THE biggest asset which the tractor manufacturer can acquire is an effective and permanent dealer organization which will allow him to feel certain of a definite production being taken care of and to which organization he can build, permanently, as fast as he can take care of the increased production necessary.

This dealer organization must be able to sell tractors at a profit, which means it must be able to sell service or to provide locally for that service.

In order that the organization be permanent, the dealer must make money and the farmer be satisfied.

This is so true that it is trite; yet it is only within the last twelve months that the new tractor manufacturer coming into the field could feel any security as to the profitable continuation of his business, and only within the last few months has a clear plan of distribution evolved from the necessary makeshifts of a new industry.

The automobile and commercial car distributor has become interested in the possibilities of the tractor business and is now busy choosing his tractor and getting ready to sell them in really large numbers next spring, knowing that he can sell them at a profit, and through intelligent service can keep them sold.

Implement Distributing Methods

To the manufacturer now planning his sales campaign a view of the field as it stands, with the experience of those companies who have made tractors, some for nearly fifteen years, is vital. Steam tractors were used for threshing and were developed into plowing jobs. With the success of the gas engine, the manufacturers of steam tractors simply substituted oil fuel. With one or two notable exceptions, there is not a tractor on the market today made by a thresher concern which does not show the steam in its design. These tractors are distributed through the old threshing machinery distributing organization. Then came the smaller tractor, and the implement companies started their manufacture. Because implements rust out rather than wear out, these implement-thresher types of small tractors were and still are noted for the amount of cast iron used.

Through many years of intensive dealer work these large implement organizations have each gained distribution in practically every town and village in the country, forcing distribution unmercifully, until there are far too many implement dealers for the average to make money.

The point for the new tractor manufacturer to realize is that each of these large implement companies have tractors, and that the credit relations in the field are such that these dealers will sell the tractors made by the "full-line" houses whose implements they sell. There are four or five such strong implement companies and the aggressive, well rated implement dealers handle their goods. The new tractor manufacturer, or the manufacturer who has been struggling through the hard years just past, can only hope to obtain the fifth and sixth rate implement dealers who sell the shorter implement lines.

Even if the new manufacturer could obtain distribution through this trade, a study of the field will show him that he does not want it. The average implement dealer is noted as being a "storekeeper," as depending on the factory traveler or blockman to sell his goods for him; as being very largely unable to sell for cash because his whole business experience and training has been along long time credit lines. He will not canvass and he will not give service, being unequipped to do so and having been trained to call in the factory service man.

Implement Dealer a Storekeeper

The records of those implement and thresher companies having the most tractors in the field at this time, and who have attempted to give factory service, prove that nine out of ten service calls have been for repair work which any local garageman could handle.

Until the tractor manufacturer realizes that in every village and hamlet in the country there are service stations giving satisfactory and efficient service on motor cars and trucks, and that these same garage and repairmen can handle their service problems, they will continue to lose sleep and energy over a problem which the previous experience of the motor trade has solved for them.

The automobile trade has shown that service is not a stumbling block on the road to profits and this same service can be carried to the farm.

The failure to give adequate service on the machines sold, and the oftentimes questionable value of the machines themselves, has soured the average implement dealer who has distributed tractors over a period of years.

The great bulk of the tractors so far sold by the implement thresher concerns have been put on the farms through the efforts of the manufacturers' salesmen working directly on the farmer and not through clean-cut dealer distribution. And every manufacturer knows that the excessive cost of such distribution means that the farmer has not received full value for his tractor dollar.

The indictment is a broad one and there are, of course, notable exceptions which prove the rule.

The New Tractor Manufacturer

Out of this morass comes the new independent tractor manufacturers and certain old line companies who are building tractors embodying all that is best in motor car and truck engineering, adapted fully to meet tractor requirements. These manufacturers realize fully the tremendous possibilities of the field and are determined to build and distribute tractors which will give good service and maintain a permanent profitable business.

Without exception—and this cannot be too strongly emphasized—these manufacturers are planning their distribution through the motor field. All talk of a new power dealer to be evolved from present

The Audit Bureau of Circulations means Circulation Facts—not Unverified Claims.

dealer classes is not pertinent to the manufacturer who wants to build a definite number of tractors in 1918 and wants to make sure they will be sold. Those of us who have studied the field consistently for several years may have definite ideas as to future growth and development and every manufacturer can afford to watch it closely, but the vital job now is to build good tractors and get them into service and keep them in service—not three or four or five years from now, but for 1918 crops.

Why has the tractor distribution swung from the implement dealer to the motor trade? Partly because of the attitude of the implement dealer as already suggested mainly because of the positive selling and service ability of the automobile man.

It is almost useless to emphasize the fact that through the motor car dealer has been built the wonder industry of the age, the very size of which staggers our imagination, and that working in close harmony with their factories, these dealers have now gotten the automobile to a point where it is as much, if not more, of a utility than the street car. He is the only dealer who can sell the number of tractors now showing on the production schedules of the new tractor companies.

More than that—several of the biggest threshing machinery and "short line" implement companies in the country have turned to the motor car dealer and are laying their trade campaigns to cash in on this opportunity.

There has yet to be an "independent" tractor manufacturer who has built and sold more than 1000 machines a year who did not sell the great bulk through the motor car trade.

Naturally those manufacturers who have made a success with pleasure cars and trucks are planning their campaigns through the automobile and truck trade.

One of the most prominent of the new companies tried for distribution in 1917 through the implement trade has now swung straight around for 1918 will go exclusively through the motor car dealer.

One of the most frequent arguments used against the sale of tractors by automobile dealers is that they do not know farm implements, without which the tractor cannot work and which the implement dealer is naturally supposed to know. The answer is, "Granted that the small town dealer may not know as much about a horse plow or a disc harrow as does the implement dealer, he does know thoroughly a far more complicated machine—the modern gas engine and its power transmission."

There is no question in the farmer's mind as to which service he wants—tractor service or implement service. Go to any farmer who owns a tractor and ask him this question, "Which would you pay higher wages to, a farm hand who is a tractor expert or one who is an implement expert; which do you yourself know less about; which expert do you need most on your farm?" You know the answer.

The plow manufacturer, in particular, recognizing that the motor car dealer will in 1918 sell more tractors than will the implement dealer, seems to be unnecessarily worried as to the intelligent sale of his product, and emphasizes to every new entry into the field the fact that tractor plow adjustment is a fine art.

There is no discounting this, but for some unknown reason the average tractor plow manufacturer seems to thinks that an implement dealer is a tractor plow expert.

The cold fact of the matter is that unless the implement dealer has sold tractor plows and has been educated to their adjustment by salesmen and expert, he knows no more about their operation than does the garageman, who, in the smaller towns, generally comes from the farm. The plow dealer must be educated to the tractor and it is more of a job to educate him than to educate the motor dealer on power plows.

The automobile dealer is aggressive, sells for cash, does a clean business, knows how to provide service, spends twice the time in the country that any other dealer does, has proven his adaptability to new business opportunities in the very fact that he is an automobile dealer and has already proven that he can sell tractors at a profit for the manufacturer and to the satisfaction of the farmer.

How the Tractor Manufacturers Feel About It

Heartily Endorses Automobile Dealer Distribution

"We are frank to say your article is right along the line we are working out in placing the products of the Four Drive Tractor Co. on the market.

There are two distinct types of tractors manufactured; namely, the old implement manufacturer and the newer blood as the type who are trying to establish a standard tractor with standardized parts and building their tractor with the best of equipment, using the best type of bearings, four cylinder motors, steel cut gears and constructing their tractor so that all working parts are enclosed. Or, in other words, following the line of construction of the high class truck and automobile.

This method of construction means a higher priced tractor, but it also means a longer life tractor and more satisfactory service to the consumer.

A tractor is under heavy and constant duty. There is no motor-driven vehicle that needs substantial construction and the best of equipment more than the farm tractor.

The method of distribution is one of the important features in the tractor industry and it seems that the logical way to handle the situation for all parties concerned is along the line of distributing the auto or truck. Sales organizations or sales companies for tractors are being organized and tractors sold by them and service is rendered by them in a more efficient manner than the manufacturers can do. The tractor service is just as essential and necessary as the auto and truck service. This service can be best rendered by the distributor and local agent. Not necessarily free service, but efficient service. When this service is rendered by the parties who are interested in seeing the consumer get the best possible results out of the product sold, it is service that counts more than just so many hours of labor.

The automobile dealers and auto sales companies are valuable assets for the tractor distributor and tractor manufacturer. Their value as tractor salesmen must not be overlooked—their value on service is what the tractor situation needs. While it will be necessary for the auto dealer, if he is to handle tractors, to adjust himself to a pulling motor power instead of speed and acquaint himself with farm machinery to be used with the tractor, it will be easy for him to do so.

They are already familiar with the gas motor. The mechanical construction of the tractor manufacturers who are using standard equipment are along the same lines the auto dealers are familiar with.

The following letters have been received by us in answer to a request for frank criticisms on the foregoing article regarding tractor distribution. Advance proofs of this article were sent to every tractor manufacturer. A great many answers were received, whereas if the old adage that "Silence gives consent" were applied to those who did not answer, it may be taken for granted that the tractor manufacturers are fully in accord with the statements made in this article.

Many letters were received from manufacturers who expressed preference for the automobile dealer, but who requested withholding their letters from publication, as they did not wish to antagonize their present implement dealer connections. This is assuredly evidence that many are ready to switch around to the automobile dealer, and that it is only a question of time within which to make proper dealer connections.

UNIVERSITY OF MICHIGAN LIBRARIES

Another important feature the new independent tractor manufacturers are attempting to establish in their distribution is cash payment, which is a better method for the manufacturer, distributor and consumer. If credit is to be given the local man knows conditions and his customers and can handle the situation. The manufacturer must be willing to adjust the compensations sufficient for the local dealer to care for the credit system, if it is to be used. Especially under the abnormal conditions in securing material is it advantageous and necessary to the manufacturer to deal on a cash basis. On this basis the manufacturer can get cheaper and quicker production."

THE FOUR DRIVE TRACTOR CO.,
J. C. JENKINS, Sales Manager.

One of the largest tractor makers in the Middle West writes as follows: "We appreciate that the automobile dealer makes a valuable tractor dealer, as he is educated to sell and sell for cash, and to render service."

The Tide is Turning

In the past we have not deemed the automobile man the proper man to handle tractors. Conditions have changed very materially, however, the past year. The farmers are buying smaller tractors and **we believe in many instances the automobile dealer can handle the smaller tractor better than the implement dealer.**

One reason for this is that the automobile dealer is generally more of a hustler than the implement dealer and another reason is that the automobile dealer is better qualified to deliver tractors in his territory and is in position to give better tractor service.

Up to the last six months practically all of our tractors have been sold direct or through special agents. **In the past six month we have been paying more attention to the automobile dealer.**

PIONEER TRACTOR MFG. CO.,
G. A. WEST, Sec'y and Treas.

Automobile Dealers the Best

Our experience has been that automobile dealers have made the best dealers as regards sales and service. The worst feature we ran against was last year. The demand for automobiles was so great and they were so easy to sell that we found many of the automobile dealers neglected their tractor sales.

Inasmuch as we handle our tractors altogether through distributors and they in turn through their dealers, it is impossible for us to advise you of the proportion of our tractors sold by automobile dealers.

BULL TRACTOR CO.,
H. C. McCARTNEY, Sales Manager.

Up to the Automobile Dealer

"We find that some automobile dealers make splendid tractor dealers, **as they are thoroughly familiar with the tractor from a mechanical standpoint,** but we believe that the majority of the automobile dealers are too busy with their automobile sales to give the tractor the proper attention. And again, a great number of automobile dealers run garages in connection with their automobile business, and having these two to look after does not have time to look after the tractor business from a standpoint of service. If the **automobile dealer would devote the proper amount of time** to the tractor business he would be the **ideal representative** for this production, but unless this can be brought about we do not believe that the automobile dealer is the ultimate man for the tractor business.

We believe that the best dealers have been men who have had no other line of business, but have made a specialty of the tractor business. We find that they will push the sales harder and soon become quite familiar with the tractor and are more satisfactory both to the tractor manufacturer and the farmer who is using the tractor.

We believe that a dealer handling tractors should make that his principal business and not a secondary matter, as most of the automobile dealers look at it."

PEORIA TRACTOR CO.,
L. R. BENTON.

The president of a large concern building gasoline engines for tractors, says: "In the writer's travels about the country, he finds automobile dealers are exceedingly interested in the sale of tractors, and such dealers are taking on tractor business more and more every day. From the standpoint of sales and service, it would seem to the writer that the present automobile dealer with a Service Department should have something that would be an excellent connection for a tractor manufacturer to make for the purpose of selling his product."

Tractor Dealer Should Also Sell Tools for It

To a great extent this article is absolutely correct. There are a few details, however, which it will be policy to go into carefully.

There is no question but what the present day truck dealer would make an excellent tractor dealer as far as service is concerned; but this is really service in the narrow sense of the word the same as you refer to it in your article.

You must remember, however, that the sale of the tractor is not the only sale that the dealer should make. When a man comes in to buy a tractor he wants to buy tools to go with it, that he is perfectly sure are adapted to it, and he would prefer to buy his tractor and his tools at the same place. Therefore, the merchant who is going to make a success of tractor sales must of necessity equip himself with a full line of power tillage tools. Then his service should cover a wider scope, because to be a successful tractor merchant he should have men in his employ who can not only teach the farmer how to successfully operate his tractor, but also how to do "Power Farming" and make it a paying investment.

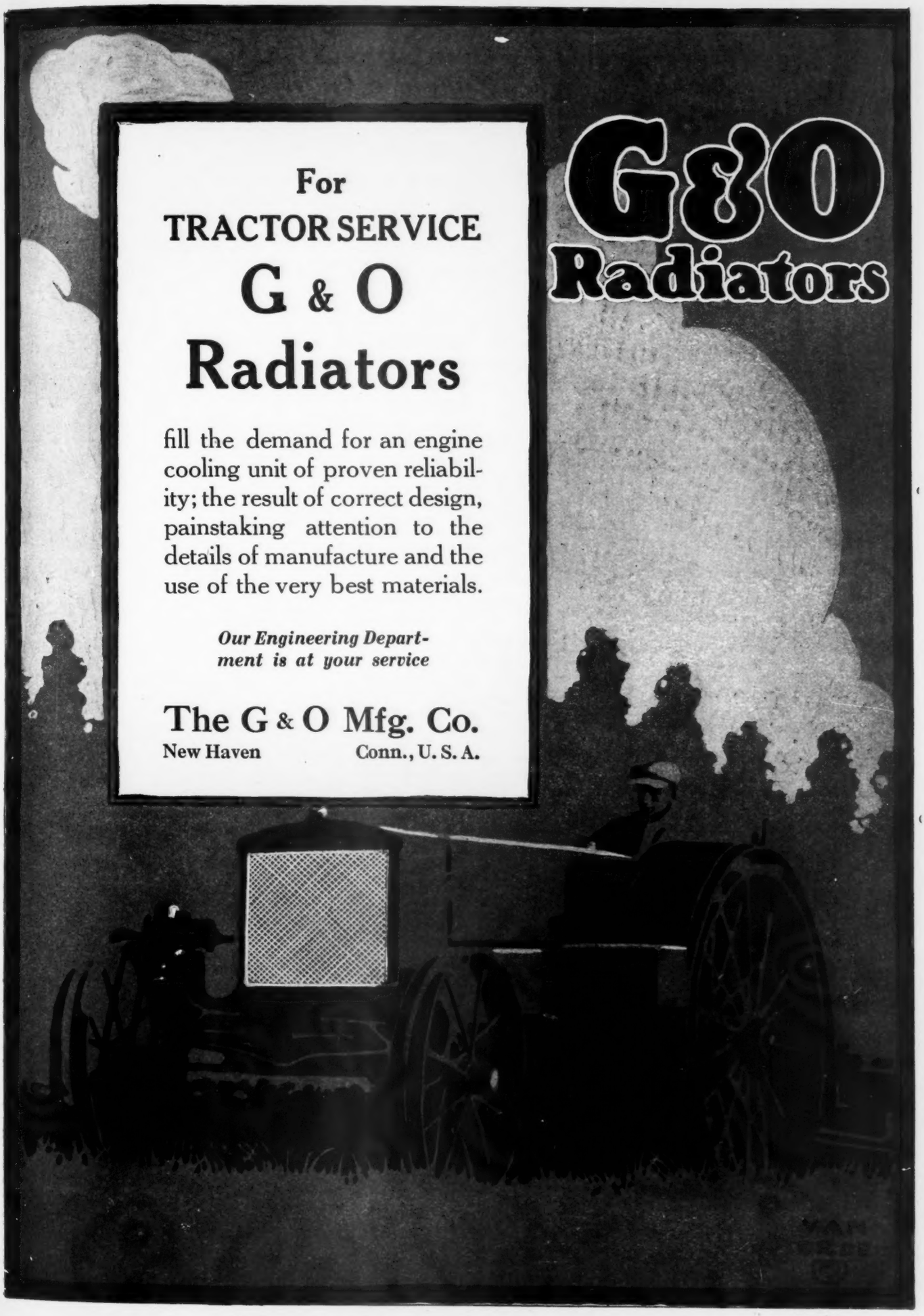
THE DAUCH MFG. CO.,
O. C. PARKER, Manager Sales Promotion Department

Another maker says this: "We feel very strongly that the successful tractor dealer of the future is more likely to be a mixture of the old implement dealer with new ideas, the automobile dealer, and that unknown quantity that we believe the tractor will develop."

Still in Doubt About Dealer

Regarding the automobile dealer as the distributor for farm tractors, the subject interests us, but we have not yet decided whether or not he will be the logical distributor. A referendum taken among our own distributors shows their opinion to be about equally divided. The trouble with the average automobile dealer, speaking particularly of those in the smaller towns, is that they are largely merely garage men and mechanics of more or less ability, without sufficient means to purchase and stock tractors, and maintain stocks of repairs. Of course, there are garage men who do buy automobiles in quantities and are good business men. Whether the former processes, naturally pertaining to the tractor trade, would appeal to them strongly enough to divide their attention with the automobile end of the business, we are not sure. The mere fact that they may have a garage reasonably well equipped to do repair work on automobiles, trucks and tractors does not signify very much; for when an automobile gets "sick" it is invariably hauled to the garage for repairs. If a tractor goes wrong it would be necessary for the repair man to visit the tractor in the field, and this might or might not be practical.

The writer personally holds very strongly to the idea that the really live implement dealer who is a business man is not only the logical but the most practical agent to handle tractors. Tractor-drawn implements naturally go with the tractor and the implement dealer has had several years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TRACTOR SERVICE
G & O
Radiators
fill the demand for an engine cooling unit of proven reliability; the result of correct design, painstaking attention to the details of manufacture and the use of the very best materials.
Our Engineering Department is at your service
The G & O Mfg. Co.
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G&O
Radiators

When Writing, Please Say—"Saw Your Ad. in the CCJ"

of education along this line. As a rule the automobile dealer—who is not an implement dealer—knows and cares very little about these lines of farm implements and machines. Whether he will be willing to learn remains to be seen.

We have put up both sides of this proposition as our experience goes to show it, from an unbiased viewpoint, believing you want our frank and candid opinion. We are, we confess, somewhat in the dark and believe we share this feeling in common with others.

LA CROSSE TRACTOR CO.,
W. A. JONES, Advertising Manager.

Prefers Automobile Dealer and His Cash Business Methods

Relative to your article on "Tractor Distribution," like many implement men, there are many garagemen with a limited knowledge of agriculture and farm implements.

However, my experience leads me to believe that from a **sales standpoint the successful garage man is just as capable of locating and interesting the prospect as the other fellow,** and I know his methods of clean-cut cash business are the more preferable to us.

It is not essential that a dealer perform repair work at no charge to the customer—far from it—but it is essential to future successful business that the customer get maximum returns on his investment. To do this the tractor must be kept working every possible day in the year.

If the customer is given proper attention and instructed from time to time in regard to the care of his motor and tractor in general, little free repair work will be necessary.

As far as operating plows and other implements used in connection with the tractor is concerned, I have found few implement dealers who know a great deal about it. They are usually quite dependent upon the farmer himself or a special expert from the implement house and the automobile man should be able to handle this part of the proposition equally as well as the implement man.

Finally when overhauling becomes necessary **the up-to-date garage can surely give much better service than an implement store.** The former makes this class of work its business and is equipped with cranes, machine tools and mechanics so that a real job can be done. On the other hand, the latter usually has few tools, etc. His mechanical work rarely calls for more than a few wrenches for setting up farm implements and he cannot afford to install suitable equipment to take care of the limited amount of this work there is to do.

In my estimation, **the ultimate tractor dealer will be the successful automobile dealer,** for he is both more able to furnish the required attention and advice and to do repair work when it becomes necessary.

MONARCH TRACTOR CO.,
FRANK H. WALKER, Sales Manager.

Automobile Garagemen Taking Interest in Tractors

"We find that there is a tendency towards the automobile man taking an interest in the sale of tractors. This, however, is not marked yet in some sections of the country. We have been building tractors for about five years and have approximately one thousand in service. Of this number probably not more than 10 per cent. have been sold by the automobile dealers. **There is, however, this year more of an interest being shown by the automobile garage man in the sale of tractors,** and we are expecting that before the year is over there will be a considerable number of our dealers numbered among the automobile garage men."

PARRETT TRACTOR CO.,
R. S. HOWARD, Assistant Manager.

The Kardell Tractor & Truck Co., of St. Louis, Mo., comments as follows: "We were much interested in your suggestions as to the future lines of distribution applying to tractors. In our candid opinion, your comments on this important subject are timely and quite suggestive."

Tractors Will be Handled by Agricultural Tractor Dealer

Our tractors have been on the market for approximately seven years. During that time we have tried various methods of selling them and find at the present time the automobile dealer is in general not entirely suited to the selling of tractors because of the lack of knowledge of farming methods and agricultural implements; on the other hand, **we have found the agricultural implement dealer is not entirely satisfactory because of his lack of experience in the care and operation of gasoline motors.**

We believe that an immense educational campaign has got to be carried on by the manufacturers to develop a proper selling and service dealer.

At the present time all tractors are sold by the direct representatives of the manufacturer following up the local agricultural dealer's customer, and all service work falls upon the manufacturer. It is generally an accepted fact that the tractor business is just beginning. We believe, however, that no one but the larger and better established manufacturers have any conception of the extent to which this is true, and of the enormous problems that have got to be solved.

The tractor business offers a most remarkable opportunity to the dealer. We believe that he will be neither an automobile dealer nor an agricultural implement dealer, but will combine ability and knowledge of both and will **be an agricultural tractor dealer.** He will maintain a service station where important tractor repairs can be made. He will also maintain a squadron of emergency men to make quick trips in the country for emergency repairs during the rush season. He will sell tractors and such agricultural implements as are used with tractors.

He will be a thoroughly practical gasoline engine man and at the same time have a practical knowledge of the operation of tractor farm implements, which implies a thorough understanding of the science of farming itself.

CHASE MOTOR TRUCK CO.,
A. M. CHASE, President.

Waking Up to Tractor Business

"We started out with the idea that automobile dealers would be the proper source from which to distribute our machines. We admit our dissappointment in this respect. The automobile dealers have not been as wide awake to the tractor situation as we have reason to expect. Out of nearly 500 tractors which were marketed since 1914, we can safely estimate that not over 10 per cent. have been marketed through automobile dealers.

We have noted, however, **a tendency of late that the automobile dealer is waking up to the real economic game.** What we mean by economic game is a comparison between the tractor and pleasure car distribution, in that the former is the economic and profitable branch of motor industry, while the latter, in a majority of instances, is a source of liability and increased expense.

We find, on the other hand, that our most profitable and satisfactory connection is the individual who has a keen foresight into what the future has in store in the tractor game, and either has the capital himself or is in a position to go into the business with him. This kind of a connection as a sales distributor has overshadowed in volume any other class of distributors, including the implement dealer. We feel that **the implement dealer is still playing Rip Van Winkle, and whiling away his time in taking care of such business as comes.** He is content to let it go at that and let the big profits in the tractor distribution flee by unnoticed. Some day he will wake up and find that he has missed a great opportunity."

NILSON TRACTOR CO.,
C. JULSRUD, Vice-President.

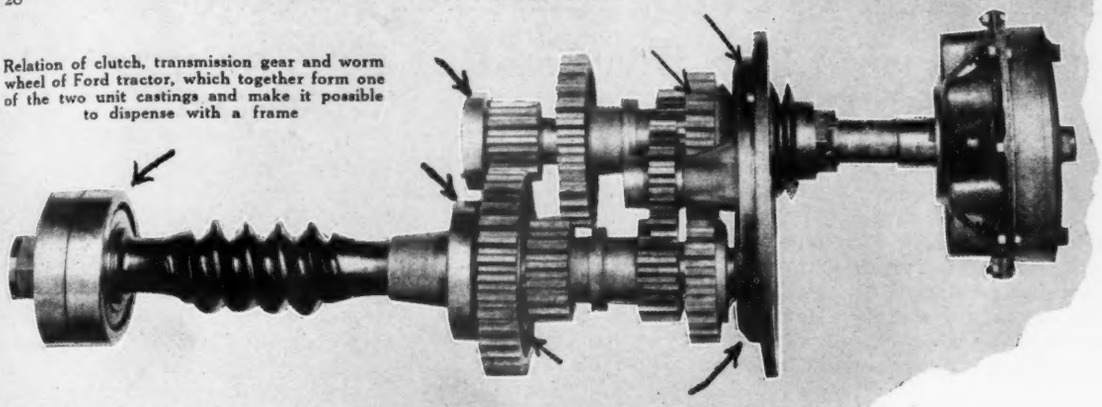
Auto Dealer the Logical Man

Although we have not as yet gone into the selling proposition sufficiently to render any judgment, the writer's opinion, frankly stated, would be that the automobile dealer is the logical man to sell tractors, as he is more wide awake, more of a hustler and has enough brains to get the cash for the goods he sells.

This, I think, is the opinion of most of the tractor manufacturers with whom I have talked along that line.

SHORT TURN TRACTOR CO.,
JOHN DAHL, President.

Relation of clutch, transmission gear and worm wheel of Ford tractor, which together form one of the two unit castings and make it possible to dispense with a frame



accordance with the speed of the engine from 6 to 14 volts, giving a hotter spark at higher speeds, being close to 14 volts at 1000 r.p.m., and it is carried to a single high-tension coil. The breaker mechanism is incorporated with the distributer and driven by a vertical distributer shaft.

Oiling is by constant-level splash with the flywheel magnets used as a distributer. The oil caught up by these magnets is thrown into a scoop at the end of an oil pipe which leads directly to the front of the crankcase. From here it overflows to a trough beneath each of the four connecting rods. The beating of the connecting rod spoons into these troughs of oil throws up a spray which lubricates the interior of the engine, including the main bearings and timing gear. No attention need be given the oil system except to see that it is supplied with lubricant. The capacity of the system is 2½ gal.

Final Reductions

From the engine the drive is transmitted to a multiple disk clutch running in oil. By means of the reductions in the three-speed gearbox and worm, which has a ratio of 17.5 to 1, the following final reductions are obtained.

Gear	Ratio	M.P.H. at 1000 r.p.m. of crankshaft
High	18.25-1	6.83
Low	85 -1	1.34
Reverse	48 -1	2.60
Plow (intermediate)	46 -1	2.70

All the gears and shafts of the gearset are chrome vanadium steel, and the shafts are carried on Gurney ball bearings having both radial and thrust components. The final drive is through an underneath worm which is a straight type, 60-deg., double-thread worm having a 1.2 pitch. The end support of the worm shaft is a duplex radial and thrust Gurney bearing. The material used in the worm is chrome-vanadium steel and the worm wheel [illegible]

riveted between two angle irons placed back to back, with the flange projecting outward to give a grip on the soil and steering. The diameter of the wheel proper is 28 in., but the total diameter is 30 in., due to the 1-in. projection of the T all around. The front axle is an I-beam forging in place of the three-piece built-up section formerly employed. The wheels are carried on radial and thrust ball bearings. Steering is through a fore-and-aft sector and pinion of a motor car type.

One of the points which has been in mind in laying out this tractor is the fact that the farmer of little mechanical experience will be required to take care of it. Everything can be reached with the least possible effort. Take one example: The crankcase can be dropped while the tractor is standing on its wheels and the only part which need be removed is the radius rod. The tractor is able to turn in a radius of 21 ft. and can work steadily with a 1500 lb. drawbar or two-plow load on the plow or, intermediate gear, having reserve power beside

METZ

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Sixteen Gurney Ball Bearings are used in each Ford Tractor because of their economy in lubricant and attention required, and because of their efficiency in operation.

Arrows show location of Gurney Ball Bearings in Transmission and Drive of Ford Tractor

Economy and Efficiency

It is universally acknowledged that ball bearings operate with much less friction than plain bearings or roller bearings.

This high efficiency means that practically all the power of the motor is applied to driving the tractor or truck.

Freedom from friction means freedom from wear of bearings and of lubricant, consequently we find that ball bearings properly used require less lubricant and fewer replacements than other types of bearings.

Gurney Ball Bearing Co.

Conrad Patent Licensee

196

Chicago, Ill. Jamestown, N. Y. New York City

GURNEY

Latest Ford Tractor Entirely New Design

Combining Unit Power Plant With Final-Drive Housing, Conventional Frame is Eliminated. Experiments Still Going on

ALTHOUGH the Ford tractor is now being produced at the Dearborn, Mich., plant at the rate of 50 per day, this output is not available for domestic use. The entire energies of the factory are now being concentrated upon supplying tractors on Government orders and extensions are being made constantly to enable the company to increase the daily output.

Although the Ford tractor is considered marketable, experiments with the same are being made daily. At present there are no less than fifteen of them working on Henry Ford's farm, while a number are engaged in experimental work on the company's holdings, about 7500 acres, around Dearborn.

This tractor is the third model put out by Mr. Ford and is much larger in size, particularly as to mechanical features, than any of the previous models. It is also slower, its maximum speed being between four and five m.p.h. The former models did not have enough power to satisfy Mr. Ford and there were certain types of service for which they did not prove satisfactory, especially work of a heavy hauling kind.

Unit construction characterizes the Ford tractor and the outstanding feature is the bolting together of the engine, transmission and rear axle housing. This construction eliminates the conventional frame. Throughout the whole machine simplicity, light weight and the best of materials are incorporated. The tractor weighs 2500 lb. Is is designed to do the work of four horses.

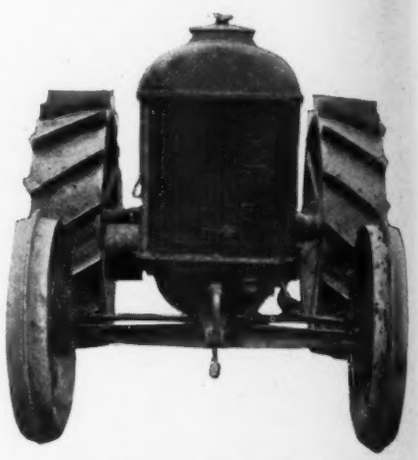
A careful examination of the Ford tractor engine discloses some of the earmarks of the regular Ford engine. The engine is a four-cylinder, 4-in. bore and 5-in. stroke, L-head block type. The cylinder block, crankcase and pistons are all cast from a semi-steel composition which includes about 15 per cent. of scrap steel in its make-up. Three bearings are provided for the crankshaft, which is 2 in. in diameter. The crankshaft bearings are 3¼ in. long and have interchangeable caps.

The camshaft is driven through a helical gear from the crankshaft. The camshaft is also mounted in three bearings. Ignition is by a flywheel magneto which is similar in design to the well-known construction used in Ford pleasure cars and trucks. The voltage varies from 6 to 14, depending on the speed, the maximum voltage being obtained at 1000 r.p.m.

From the magneto the current is delivered to a single coil. The distributor is mounted on a vertical shaft which is driven from the camshaft.

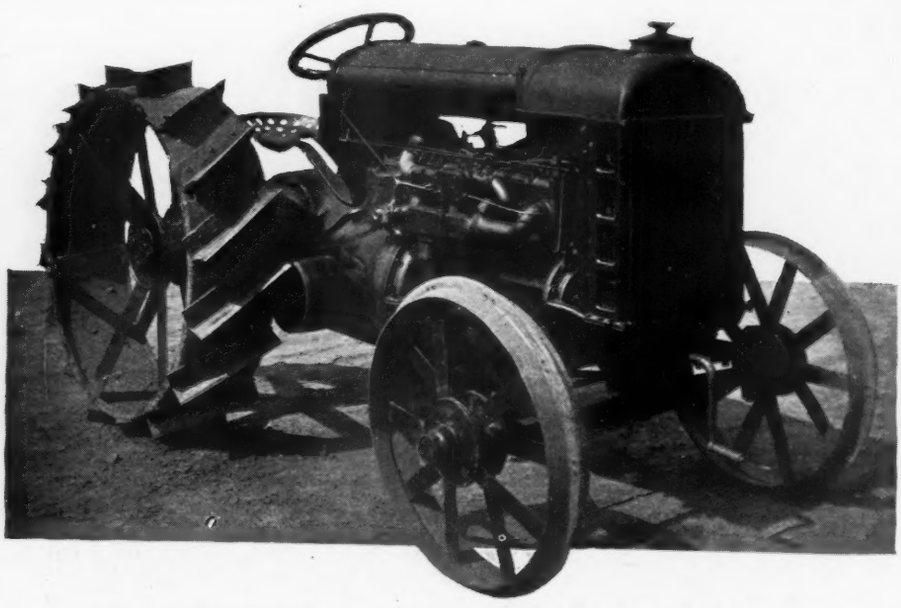
Lubrication of the engine is effected in somewhat the same manner as in the Ford pleasure car engine. The flywheel magnets are used to throw the oil into a scoop fitted to the end of an oil pipe. The oil pipe leads to the front of the crankcase, where the excess lubricant overflows to the troughs which are directly underneath the connecting-rods. The spray thrown up by the connecting-rod's ends lubricates the interior of the engine as well as the timing gears and main bearings. The capacity of the system is 2½ gallons. The level of the oil is carried somewhat higher in the final drive compartment so as to thoroughly lubricate the transmission and the worm gear.

Cooling is effected by the simple thermo-syphon system. The radiator has a capacity of 11 gallons. The water jackets extend the entire length of the cylinder, clear down to the crankcase flange. Especial attention is given to the design of the cooling system in that all water passages are designed so that steam pockets cannot form. The radiator is of the flange-tube type, having an 18 x 20-in. core with a thickness of 4 in. Increased cooling is effected by a four-blade fan of airplane type, being 17 in. in diameter and operated by a 2-in. flat belt. Two-inch cast iron pulleys are fitted at the end of the crankshaft and the fan shaft. The fan is ball bearing mounted.



Front View of the Ford Tractor

Note the rocking front axle and steering connections. Radius rods are attached to the under side of the crankcase.



Three-Quarter View of the Ford Tractor, Showing the Sturdy-Looking Design

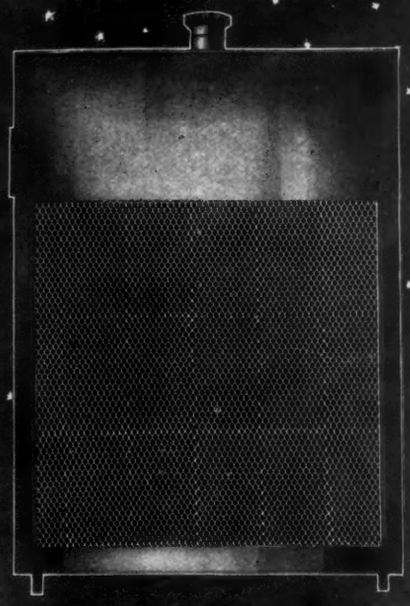
Kerosene fuel tank is carried directly above the engine. Engine, transmission and final drive are practically one unit

This tractor is designed to run on kerosene, for which purpose an especially large tanks is provided, having a capacity of 21½ gal. The tank is mounted directly over the engine. For starting, a 1-qt. gasoline tank is supplied. The carburetor is of the single bowl type and is connected with a vaporizing manifold, in which the intake passes through a coil surrounded by the exhaust gases. At first the kerosene is sprayed into the primary air. After the mixture has been thoroughly vaporized, additional air is allowed to enter at a point above the coil. A damper on the manifold is fitted for controlling the amount of heat applied to the coil.

Clutch is of the multiple disc type, running in oil, and is composed of 17 tempered steel discs. The discs are 17 in. diameter and have an effective working width of 1 1-16 in. The discs are held in engagement by six 80-lb. springs, giving a total pressure of 480 lb.

Everybody who is anybody in the truck industry reads the CCJ

Fedders Are Doing Their Bit



NEVER in the history of the world has the vital need for big crops been as great as now. All humanity looks to America to feed the starving millions in Europe. Food supplies and not shrapnel will win the war for civilization.

Fedders are doing their bit. Through days of torrid heat, when horses cannot be worked at top speed, they are enabling hundreds of farmers to run Fedders-equipped tractors seven days a week—24 hours out of every day whenever necessary.

Tractor radiation presents many problems not met with in commercial or pleasure car service. To these problems we have brought the experience gained through more than seventeen years manufacturing radiators of the highest quality.

Our engineering department is at your service. Send us blueprints giving details —we will gladly do the rest.

FEDDERS MFG. CO., Inc.
BUFFALO, N. Y.

FEDDERS RADIATORS

Coleman Has Worm Drive

THE Coleman tractor is a four-cylinder, four-cycle, two rear-wheel drive tractor, using a Schebler carburetor, Dixie magneto, Erd 4 x 6-in. engine, a 24 x 30 x 3-in. Perfex radiator, with a fan and a circulating pump cooling system. The clutch is of the internal expansion type. The steering device, front and rear wheels are of recognized quality and of late improvement. Roller bearings are used except in the transmission, where ball bearings are used.

The distinctive features of the Coleman tractor lie in its transmission and worm drive. The transmission has a low number of gears, including only three movable parts. These three parts are only in action during the interim of gear shifting and are inert when the tractor is at work on direct drive from the engine to the worm drive. This direct drive is claimed to give the most effective application of power, with no additional friction of the gears.

The Coleman Tractor Working in the Field Under Normal Conditions.

The drive wheels are 42-in. diam. and a 25-in. master gear is driven by a 3½-in. tooth-lined worm. This worm is tool steel and is cut in a special machine. The master gear is bronze and the whole is enclosed in a case and runs in oil.

The features claimed are simplicity, efficiency and durability. The application of power through the worm gear allows the use of housed gears running in oil and eliminates the need of intricate and multiplied gears. The weight of the Coleman tractor is 4000 lb. It is said to do the work of from six to eight horses on a farm under normal conditions, pulling three 12-in. plows at 2½ m.p.h. and at an approximate cost in fuel of $3 per day. It has a wheelbase of 72 in. and a steering angle of 52 deg.

This compact, sturdy tractor is sold for $1050 by the manufacturers, the Winslow Mfg. Co., 16th and Walnut Sts., Kansas City, Mo.

The transmission is of the three-speed type, all gears and shafts being of chrome vanadium steel. The shafts are carried on ball bearings which are capable of taking both radial and thrust loads.

The final reduction is transmitted by an undermounted worm gear, having a double-thread straight worm with a pitch of 1.2 in. The worm shaft is supported at the rear end in a duplex radial and thrust bearing. The worm is made of chrome vanadium steel, while the worm wheel is of aluminum bronze which is a composition of 10 per cent. aluminum with 90 per cent. copper. The worm wheel and differential housing are bolted together with twelve bolts. The differential, of four-pinion type, transmits the drive to the semi-floating rear axle. The driving wheels, which are 42 in. in diameter, are mounted on the shaft by means of a slotted, tapered hub filling provided with a flange drilled for four heavy cap screws.

An automobile type steering wheel is used. The hand wheel is 18 in. diameter and the steering reduction between pinion and sector is 3½:1.

The front wheels are made of hot rolled steel and are constructed of built-up T section, the spokes being riveted between two angle irons placed back to back. A flange projecting outward serves as a skid ring. The front axle is an L-section forging, the wheels being carried on combination radial and thrust ball bearings. The clearance of the tractor is 11 in., the lowest point of which is at the flywheel housing. The tractor can turn in a radius of 21 ft. and can work steadily under a 1500-lb. drawbar pull or the equivalent of a two-plow load on the lowing or intermediate gear. It is interesting to note that very little cast iron is used in this tractor, the only case being in the valve heads. All other parts are either chrome vanadium steel, semi-steel, high-carbon steel or hot rolled steel.

The New Ford Tractor Doing Experimental Work on Henry Ford's Farm

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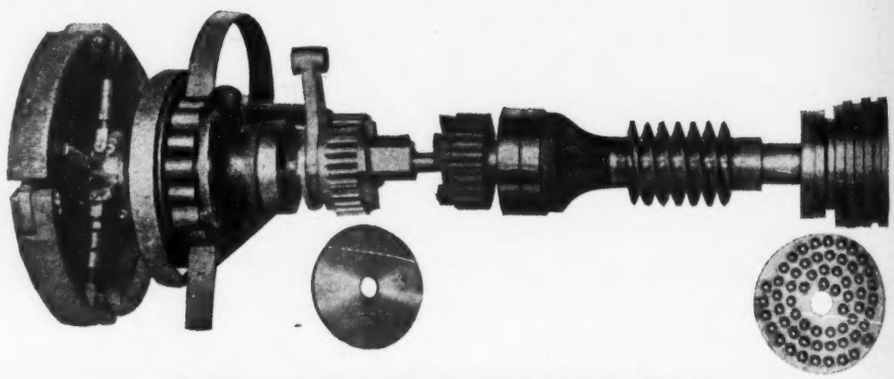
OHIO TRUCK ATTACHMENT CO., Cleveland, O., has been formed with a capitalization of $5000.



The Power-Transmitting Parts of the Coleman Tractor

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STARTING LIGHTING & IGNITION EQUIPMENT

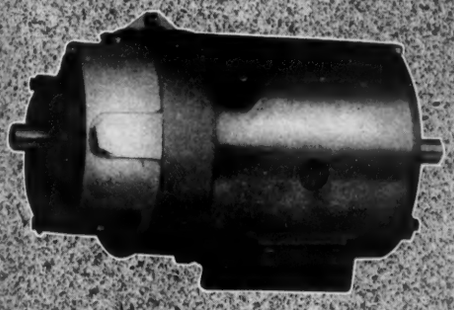
Help the Farmer Win the War

Working the farm and hauling the produce long into the night has demanded electric lighting for the tractor. Not the kind of lighting system that expects expert care, but the kind that takes care of itself.

The Westinghouse Generator developed for rough duty army trucks is recognized as the ideal generator for the tractor. It is rugged, self-regulating, gives ample, steady light even though the storage battery becomes disconnected.

And to start that heavy engine on low-grade fuel—a job that needs more than a man—Westinghouse furnishes a sturdy, dependable Starting Motor.

Westinghouse Starting, Lighting and Ignition Equipment keeps up with the increasingly heavy requirement of motor service.



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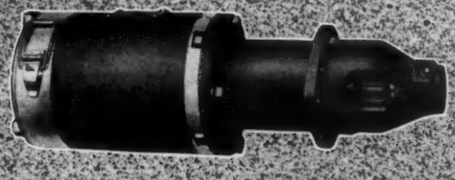
WESTINGHOUSE ELECTRIC



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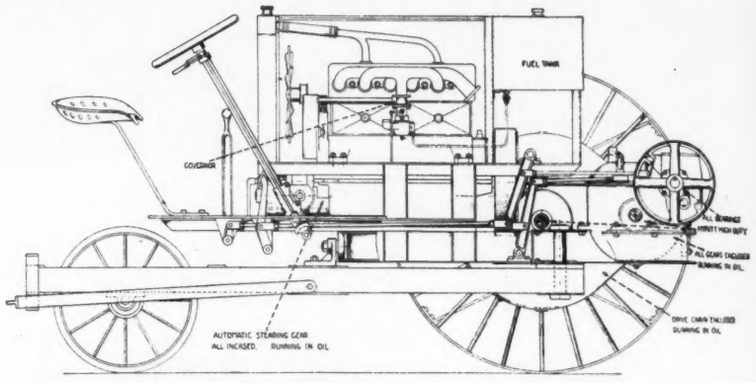
When Writing, Please Say—"Saw Your Ad. in the CCJ"

Lang Tractor Gives a Constant Center Pull

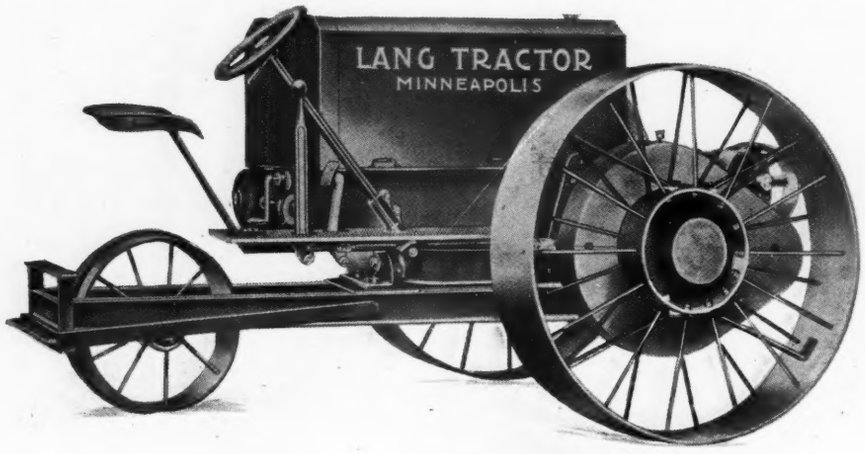
The big feature in the Lang tractor which is built by The Lang Tractor Co., of Minneapolis, Minn., is its exceptional pulling power, due primarily to the use of the downward hitch, and the entire weight of the tractor placed over the drive wheels. The draw bar is fastened in front of the axle and below the center of the wheels; consequently the harder the Lang pulls, the more power it gets, because the drive wheels are forced to give more traction. This downward hitch enables the tractor to develop a pulling power which the makers state is greater than its own weight.

The Lang is a three-wheeled tractor, the power and steering wheels being at the front. The wheels are powered steered so that perfect control is had over the machine at all times. The whole machine is constructed throughout with the one idea of having every part made as strong as possible. Cheap construction is eliminated entirely.



Note the Clean-Cut Design of the Lang Tractor

Power wheels at the front and a downward hitch enable this tractor to develop tremendous pulling power



Side View of the Lang Tractor

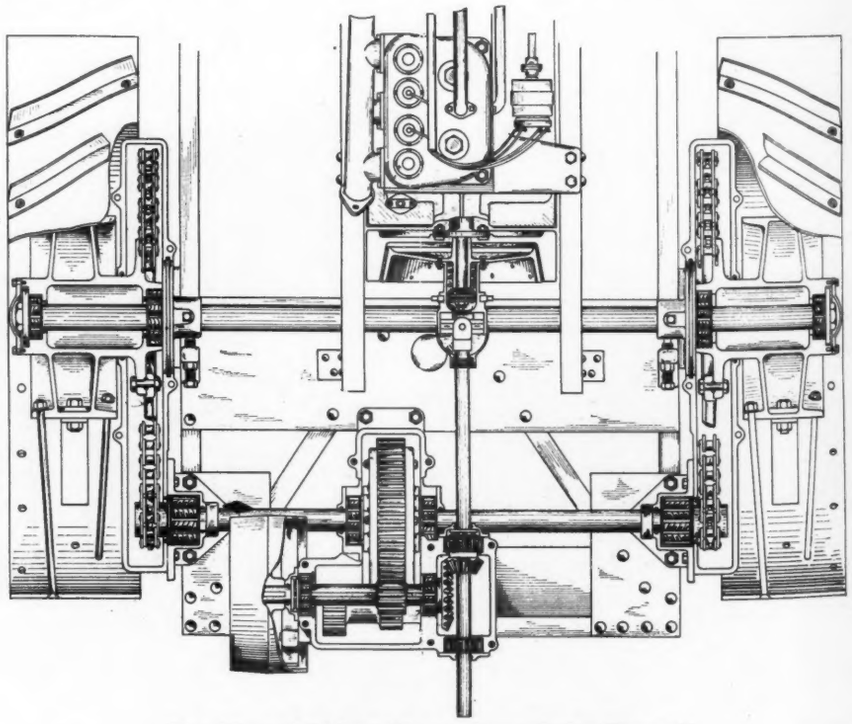
The drawbar is fastened in front of the axle—below the center of the wheels. Thus the harder the tractor pulls the more traction is applied to the drive wheels

The illustration shows the clean cut design of this machine, and also the entirely enclosed working parts. All bearings and running gears are covered and run in oil, eliminating dirt and grit and greatly adding to the life of the machine. One oiling each season is all that is required.

The Lang machine will burn either gasoline or kerosene, and is rated at 15 h.p. at the draw bar and 30 h.p. at the belt. The engine is a Waukesha 4-cylinder, 4¼-in. bore, 5¾-in. stroke. The power transmission is by gear to a cross shaft with final drive by chains to the power wheels. This machine is designed to pull either 2 or 3 plows at a speed of 2½ m.p.h. while the road speed is 5 m.p.h. The speed of the engine is 900 r.p.m.

Other Specifications

Timken heavy duty bearings; Rayfield carburetor; Dixie high tension magneto; height over all 60 in.; diameter of drive wheels 50 in., face 12 in.; cone clutch; diameter of pulley 14 in.; face of pulley 7 in.; capacity of fuel tank, 20 gals.; weight 4200 lb.; length overall 116 in.



Plan View of the Lang Power-Transmission Elements

This illustration shows clearly the course through which the power is transmitted from the engine to the drive wheels. Note the all-enclosed bearings

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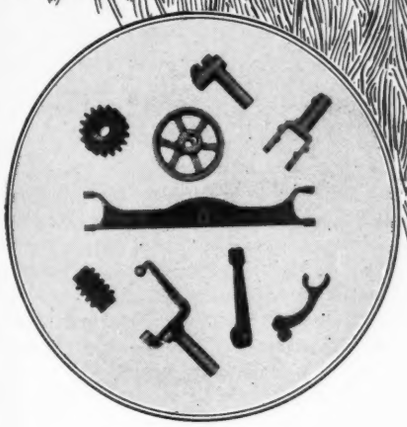
TRANSCONTINENTAL MOTOR TRUCK CORP., Buffalo, N. Y., has been formed with a capitalization of $1,250,000 to manufacture trucks, engines, motor boats, etc. The incorporators are: P. J. Bloxham, E. S. Stengel and R. A. Schmidt.

WEIDELY MOTOR CO., Indianapolis, Ind., has secured a contract from the Cleveland Tractor Co., of Cleveland, O., to manufacture tractor engines for it for the next three years. The contract calls for 5000 tractor engines during the first year and for increased numbers thereafter.

Opportunity comes to the well-informed. Read the CCJ



Sivyer Steel Castings Strengthen Strong Tractors

THE average tractor of today fails, not because it cannot turn over one or two acres of land a day for a couple of weeks at a time, but because it will not last for years.

There is no question but what the tractor receives more wear and tear, more gruelling work than almost any machine built. Over rough ground, through clay, gravel, loam or sand, it must drag its gang, and when the plow hits a stone or root, think of the strain on the engine.

Isn't it significant, therefore, that tractors that you hear most about, that have greater reputations for continued performance, for low operating and maintenance costs, are those where Sivyer Steel Castings are used throughout?

Made of electric furnace steel, freer from imperfections, sand holes, etc., held up to a rigid and inflexible standard of quality, the Sivyer Steel Casting represents to the tractor manufacturer the success of his machine.

But don't take our word for it. Let us give you a list of the tractors using Sivyer Steel Castings. Let us tell you in detail about the tests that Sivyer Steel Castings are submitted to, before you are allowed to receive them. Simply write. There is no obligation.

Sivyer Steel Casting Co.

Milwaukee Wisconsin

Electric Furnace Steels

Kerosene for Farm-Tractor Engines*

By W. G. CLARK, Chief Engineer Wilcox-Bennett Carburetor Company

THE use of low grade fuels for tractor and truck engines has been for some time the subject of considerable debate and experiment. Of the data now available on the subject there are many that are conflicting and erroneous, but enough careful work has been done so that certain fundamental principles, essential to efficient and satisfactory use of low-grade fuels, have been established and are more or less common knowledge. These requirements are well defined and have been put before engineers and manufacturers many times. The shortsightedness of the majority of engine manufacturers and their reluctance to effect changes in design which are so necessary in handling low-grade fuels, have been chiefly responsible for the failure of most of the so-called kerosene tractors, and have given kerosene and other low-grade fuels their present ill reputation.

The object of this paper is to again set before those most interested what has been done and what must be done to make all tractors successful in operating on low-grade fuels, and in this way to further the work of co-operation and standardization so vitally necessary in the tractor industry to-day.

Methods of Applying Heat

The treatment of all low-grade fuels is essentially the same, but I wish to deal more specifically with kerosene, as it seems to offer the most logical solution of the present fuel problem.

All experiments with kerosene show conclusively that heat must be applied to assist in vaporizing the fuel, particularly for multiple-cylinder engines, so that the first step in the solution of the problem lies in the determination of the best method of applying the heat. There are four principal methods now in common use:

(1) Applying heat directly to the liquid fuel before it leaves the nozzles. This gives maximum power and fair economy, within limits, but lacks flexibility.

(2) Exhaust jacketing of the intake manifold, which heats the whole mixture. This entails a high volumetric loss, but gives good economy and flexibility.

(3) Preheating the air before it enters the carburetor, which produces a high volumetric loss and poor economy. This method does not apply the heat at the right time or in sufficient quantity, with the result that a large part of the fuel either goes out with the exhaust or into the crankcase.

(4) A compromise of the two extremes, effected by exhaust-jacketing a part of the carburetor above the bowl. The fuel charge and a small portion of the air are heated to a high temperature, and after passing through the heat chamber are diluted and mixed with cold auxiliary air. This produces a mixture with all the advantages, to a slightly modified degree, of the other methods, and with none of the disadvantages.

There are numerous combinations and modifications of the above methods of applying heat, but they all can be classified under one of the four heads.

With the hope that perhaps it will save others unnecessary work, I will outline a few of our experiments in determining the best method of obtaining proper low-grade fuel mixtures.

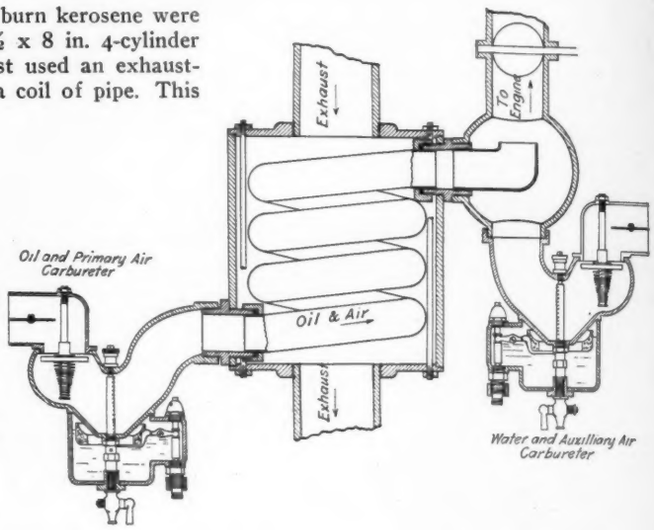
Our first attempts to burn kerosene were made in 1911, on a 6½ x 8 in. 4-cylinder L-head engine. We first used an exhaust-heated box containing a coil of pipe. This pipe was connected to a carburetor and to the engine manifold. The kerosene was drawn through the pipe coil with a small quantity of air and heated to a high temperature by the surrounding exhaust. After passing into the manifold the hot, rich mixture was diluted and cooled with cold air and water vapor, drawn from a second carburetor connected to the manifold beyond the heater. With this apparatus we lost too much power and had great trouble with preignition and formation of carbon in the heater.

We then tried forcing the mixture through with a portion of the exhaust to reduce resistance in the heater and to increase the temperature, but we still lost power, and the preignition was worse than ever. The pistons were then given more clearance, and a stream of cold water turned onto the spark plugs, which were in the valve caps, and the preignition was materially reduced. Although the temperature got as high as 900 deg. F., the fuel did not crack. We proved this by interposing a radiator as a condenser between the heater and the manifold, and were then able to condense the fuel back to raw kerosene.

The second apparatus was a slight modification of the first, and was used on the silver-medal winner of the 1911 Winnipeg Tractor Contest. It gave good economy and flexibility, but lacked power, and was extremely cumbersome.

Fuel-injection methods were next tried, but were found to be too delicate on account of the small quantities of fuel used. Mechanical difficulties also involved so many complications that this method was abandoned as impracticable.

We also tried heating the air in an ordinary gasoline carburetor, but again lost too much power, and encountered more preignition and distribution trouble.



Type of Carburetor Tested in 1911

Air and Kerosene are drawn from the carburetor on the left through the heating coil, then mixed with the cold air and water vapor, thence passing on to the engine. With this apparatus, the loss of power was great, as well as trouble from preignition and formation of carbon in the heater

The next logical step was to heat the fuel, which we accomplished by exhaust-jacketing the fuel bowl. By deflecting a portion of the exhaust gases through this double bowl we could maintain the temperature of the liquid fuel nearly at the boiling point. To atomize the fuel we used a multiple-jet standpipe with about seventy-five jets. This broke up the liquid into very fine particles, giving a decided gain in horsepower, although the economy was practically the same as with the first heater at full load. The light-load economy and the flexibility were not so good.

We next worked to get better economy and flexibility by making various devices to break the fuel into finer particles. Some successful ones were tried, and improved the economy greatly at full load, but they proved to us that light-load economy and flexibility are dependent on high temperatures unless excessive gas velocities are maintained. But to maintain a high gas velocity at low speed means wire drawing and volumetric loss at high speed, so we abandoned our mechanical vaporizers and went back to the heat problem.

These experiments had shown that we must use high temperatures for light loads and low speeds, and as little heat as possible at heavy loads and high speeds, depending on velocity to prevent condensation at the higher speeds.

* Paper read at the Fremont S. A. E. Tractor Dinner.

"A little knowledge is a dangerous thing." The CCJ keeps you fully posted

After numerous experiments with jacketed manifolds and various combinations of heated air and heated fuel, we evolved our present type of carburetor, which is a compromise, embodying as far as possible the best features of our other designs so as to give the maximum of power consistent with flexibility and economy. In this carburetor we utilize the whole exhaust of the engine, passing it around a heat chamber through which the fuel and a small portion of air are carried. The high temperature to which this primary mixture is subjected is lowered beyond the heat chamber by the admission of cold auxiliary air. To obtain the higher temperature necessary at light loads we employ a weighted valve in the carburetor. The valve is controlled by the engine suction, which admits hot primary air at light loads, raising the mixture temperature when the exhaust gases contain the least heat. This valve closes under the increased suction of heavy loads and admits cold air to the heated chamber with the fuel. This admission, together with the final dilution of the rich mixture with cold auxiliary air, helps to offset the increased and unnecessary temperature of the exhaust at heavy loads. With this scheme we obtain the best heat conditions for kerosene, namely, hot air, hot mixture at light load, cold air, cooler mixture, and high velocity at heavy load. Additional cooling is provided for by the admission of water when necessary, by means of the same valve that regulates the primary air temperature, so that the entire heat control is practically automatic.

Many Difficulties Encountered

The foregoing deals merely with obtaining the mixture by the proper application of heat. We had innumerable difficulties with gas distribution, manifold condensation, pistons and spark-plugs, which I wish particularly to consider in order to show that the kerosene carburetor does not exist as such by itself. The kerosene tractor, however, must include:

(1) An efficient vaporizing device to produce a homogeneous combustible mixture.

(2) A properly designed manifold to carry the mixture to the cylinders without condensation and with uniform distribution.

(3) An engine so designed as to take care of the higher operating temperatures of kerosene and capable of burning a kerosene charge efficiently.

The first two requisites have been more fully developed than the third, and until the engine manufacturers and the accessory men co-operate in producing a real kerosene engine the kerosene tractor will remain as it is now, a makeshift at the best. There is no gainsaying the fact that the majority of so-called kerosene tractors are failures. The best of them are far from being as efficient and easy to operate as they should be.

Gasoline equipment will not handle kerosene satisfactorily, nor will the installation of a kerosene device make a kerosene engine out of a gasoline engine, notwithstanding popular belief to the contrary.

The failure of the engine makers and the carburetor men in the past to get together and secure the best results in handling low-grade fuels is due to several things, chiefly:

(1) The reluctance of most of the engine manufacturers to accept the results of outside experiments as affecting engine design.

(2) The high cost, lack of adequate facilities and time required for effective experimental work.

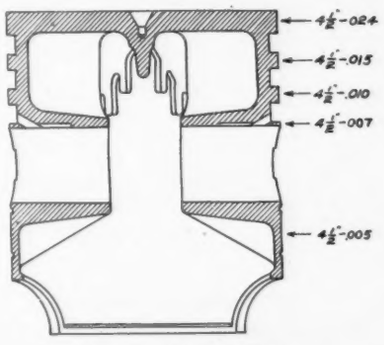
(3) Stress of increased production demands, precluding radical changes.

The result has been that the carburetor men have assumed the whole burden, and have been expected to produce an instrument that will make a kerosene-burning engine out of the existing types of gasoline engines.

All of the kerosene-burning tractors now on the market can be roughly divided into two classes: those in which efforts have been made to adapt the engines for kerosene work, and those that simply have one of the numerous kerosene devices attached. The latter are by far in the majority, and it is largely owing to their failure as efficient kerosene tractors that the poor opinion of kerosene as a fuel exists. To illustrate how machines in this class will fail, take the experience of a service man who was delivering a new tractor. It was one of those equipped with a heated air carburetor for kerosene, and as is usually the case when these machines are running with light load the mixture had to be pretty rich in order to keep the engine going. After traveling a few miles from town the lubricating oil got so diluted by raw kerosene working past the pistons that two bearings burned out before the operator was aware of it. This was on a new machine that had not even reached its point of delivery.

Kerosene Engine Design

The first and most important things to consider in kerosene-engine design are the clearance and cooling of the pistons. Owing to the higher operating temperatures in kerosene work the heating and expansion of the pistons are much greater than with gasoline, so that the clearance between the cylinder walls and the pistons must be greater to prevent seizing and scoring. Experiments with various types and sizes of pistons have shown that the body clearance should range from one to one and a half thousandths per inch of diameter. The rest of the piston should be tapered toward the head with a clearance of four or five thousandths per inch of diameter at the extreme top. This is considerably more than the clearance used in automobile practice, but the tractor piston is subjected to higher and more sustained temperatures than the automobile piston ever is. If clearances are not sufficient to take care of the additional expansion the pistons will seize and score the cylinder, or at least cause heavy preignition.



Kerosene-Engine Piston

Due to the high and sustained temperature of the piston, it is given much greater clearance than in motor cars. It is tapered at the upper end.

Piston heads should be thick and well ribbed and filleted to carry the heat away from the center of the head in the piston body, when it can be transmitted to the water-jacketed cylinder walls. If this is not done, the center of a piston will frequently get red hot and cause preignition.

Ring gaps should also be slightly greater in the kerosene engine to allow for expansion. Water jackets must be extra large and unobstructed, and should be carried a trifle lower than is customary in gasoline designs so as to afford a free and uniform circulation of the cooling water and to help carry heat away from the body of the piston.

Valve seats, especially exhaust-valve seats, should be well water-jacketed, because a hot valve or valve cap will cause a great deal of preignition trouble that is hard to locate.

The Combustion Chamber

The form of the combustion chamber, the efficient cooling of the valves, together with the fact that the intake passages have so few turns and pockets; make the valve-in-the-head engine so well adapted to low-grade fuels.

The compression is usually somewhat lower in kerosene work, although it is difcult to give any fixed rule for determining it. We have found that the best results are obtained by lowering the compression as far as possible without sacrificing power. In some engines it is possible to drop the compression twenty or thirty pounds without losing in maximum power, although naturally the fuel economy and efficiency will not be so good. For good all-around work the compression rarely exceeds sixty-five pounds, although it can sometimes be carried higher in an exceptionally well-cooled engine.

The type and location of spark plugs is a very important factor in kerosene work because the spark plug is one of the commonest sources of preignition. A plug with a heavy metal body and heavy wire electrode presents a large heating surface to the burning charge and often becomes red hot, causing excessive preignition.

The plug should preferably be located in the center of the cylinder head in a well water-jacketed position, so as to be cooled as much as possible. A spark plug placed in valve cap, especially over a hot exhaust valve, cannot be cooled, and will burn up and cause preignition with kerosene fuel.

Cylinder combustion chambers must be smooth, since rough spots or small metal projections soon become glowing points.

There is still much to be done toward perfecting the design of manifolds for low-

grade fuels. In multiple-cylinder engines the problem of distribution without condensation of the fuel is just as important as, and probably more difficult than, the production of a vaporized charge. Experiments have shown that kerosene mixtures will condense in the manifold at a temperature below 350 deg. F., unless the gas velocity is kept high. For this reason the best results are obtained by making the manifolds as small as possible without causing a power loss and wire drawing. This is feasible with the tractor engine because it is still essentially a slow-speed unit.

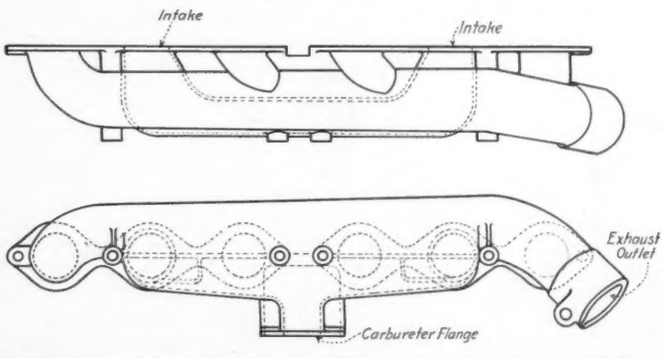
We experimented with a manifold composed of a bundle of small copper tubes soldered together and having a sliding throttle, which controlled the number of tubes in operation. We were thus enabled to maintain a practically constant velocity at all speeds, which meant that by carrying an initially high velocity we could maintain a dry mixture with the minimum of heat.

In some of our earlier kerosene experiments, excessive manifold condensation gave us a great deal of trouble. We found that by placing dams of baffles in the manifold that this trouble could be greatly reduced. The fuel in breaking over the sharp edge of the baffles was pulverized into very fine particles instead of going through in large globules.

I believe that a manifold should not pass through the water jacket if kerosene is to be used as a fuel. The temperature of the water jacket is lower than the mixture temperature at light loads, so that condensation and loading would result, although at full load it would not make so much difference.

In general a small manifold designed for uniform distribution and as short as possible will give the best results. It is hardly necessary to dwell on the fact that the fewer the turns in the manifolds and pockets in the valve chambers and cylinders the better the distribution and operation obtained.

The present design of engines with opposed cylinders with their long exposed manifolds offers the greatest difficulties in distribution of heated mixtures. However, these difficulties can probably be largely overcome by exhaust jacketing insulation or by retarding the intake valve opening to obtain a high vacuum.



Combination Intake and Exhaust Manifold for Kerosene

The designs of double or exhaust-heated manifolds now in use for multiple-cylinder engines are all more or less open to criticism. In most of them only the upper wall of the intake manifold is in contact with the exhaust. This construction produces a condition in the mixture which is diametrically opposite to that desired. The lighter and therefore more thoroughly broken up particles of fuel impinge directly on the upper hot surface, while the heavier unvaporized globules of fuel follow the lower and less-heated wall, especially at low velocities. This does not make for a homogeneous mixture, and is likely to produce carbon through cracking.

Another form of the exhaust heated manifold which does not distribute the heat uniformly is of the type that allows the exhaust to escape from one end only. This means that those parts of the intake nearest the exit receive more heat than other parts farther away.

In spite of precautions against preignition we invariably encounter it in high temperature work unless the compression is so low that the efficiency is greatly decreased. A well designed engine will deliver a little more than three-quarters of its maximum power without preignition, so that it should not be necessary to use water in the mixture much below that point. The primary object in using water is to cool the mixture before it enters the cylinders, so as to keep the volumetric efficiency as high as possible and to prevent preignition. In some types of engines a large amount of water is necessary, varying from 20 to 50 per cent., but if properly used in a well-designed engine, from 6 to 12 per cent. should be sufficient.

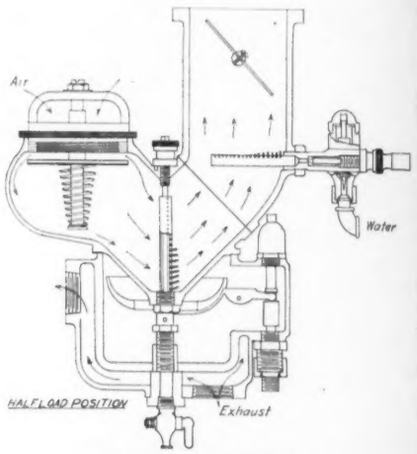
In order to use as little water as possible it should be introduced in a finely atomized condition. It will then present the greatest cooling surface with the least volume. The necessity of using a minimum of water is apparent when we remember that in vaporizing the water extracts heat from the fuel, so that for every ounce of water it takes about 5 per cent. of that amount of kerosene to vaporize it. This fact is often disregarded and water is allowed to slug into the mixture in excess quantities producing poor economy, missing and loss of flexibility. Since water in a finely pulverized state will absorb a large amount of heat, it serves as a very simple and effective means of lowering the mixture temperature and preventing preignition.

We have never been able to find any evidence that water had any appreciable effect either in the formation or removal of carbon.

Still another factor must be considered in making kerosene tractors, and that is the ability and knowledge of the men who are to handle them in the field. It must be admitted that the very best of our kerosene tractors are not quite as easy for the average farmer to operate as the gasoline tractor, so that to insure the success of kerosene as a fuel we must go beyond the mere manufacture and marketing of the machine, and must instruct the owners and operators in the handling of low-grade fuels.

A good kerosene tractor in the hands of a poor operator will behave just a little bit worse than a gasoline machine with the same operator, so that it is our duty to make our products as nearly right as possible, an second, to give the farmer the benefit of our experience in using them. It is only in this way that we can hope to make the kerosene tractor the success it must become.

The trade papers are doing a great work along educational lines, but some of them have failed in one respect, and that is, in their evident failure to investigate the truth of their advertising. This has resulted in the publication of a great deal of misleading information, especially concerning so-called kerosene-burning devices, some of which cannot possibly do what the advertisers claim for them.



Carburetor at Half Load

This is a Wilcox-Bennett carburetor. The fuel is heated in the bowl, and auxiliary air and water vapor added close to the throttle.

The advertising and sale of products that cannot be successful has done much damage to the reputation of kerosene tractors and to kerosene as a fuel. At this time it is a patriotic duty of every advertiser and publisher to make sure that he is not misleading the tractor-buying public. The trade papers with a little care can do much to eliminate this evil.

Thermodynamics and fundamental principles of carburetion have been presented and discussed many times by able men, so I have purposely refrained from a repetition of well-known facts as far as possible. Instead I have tried to put the kerosene tractor situation in such a way that the members of the S. A. E. will endeavor more earnestly through the organization to effect the co-operation of the engine manufacturers, the tractor men, the accessory men and the trade papers; and by so doing hasten the development of what is now one of our greatest economic necessities, the standardized American kerosene tractor.

Advertising in the CCJ is memory insurance. "Out of sight, out of mind," you know

THE PUBLISHERS' PERSONAL PAGE

Help Win the War—Be an Optimist

Problems and Prosperity

WE HAVE now been actively engaged in the most serious of all enterprises—war—over half a year.

It is apparent that the three most effective weapons are men, money and materials. The war, therefore, has been reduced to the science of business. The same things are essential in our commercial life that are the three principal requirements in our present undertaking against the Imperial German Government.

To take from the industries of peace and divert to the industries of war, men, money and materials, on a stupendous scale, brings every business man of this country face to face with problems of great magnitude. When, however, a country that is at war has great natural resources, when its territory is not invaded and when the existence of the country is not at stake, industries thrive and prosperity is universal. Therefore, we are confronted with conditions that belong under the heading of "Problems and Prosperity."

The question of materials seems serious, but our Government has wisely and early adopted the plan of conserving these. The methods they employ will prevent hoarding, but will not deprive any legitimate manufacturer from obtaining what he requires.

Billions of dollars that have been saved and have been lying idle in banking institutions throughout the country are now put into circulation, for the money that the Government borrows goes back into some enterprise and keeps moving on. Therefore, the billions of dollars loaned the Government can be classified as a liquid asset.

Men will have to work longer hours; short cuts for producing quickly will have to be found; women will have to take the place of men in many lines of endeavor; but still prosperity will be in evidence, and it is right that it should be so, because prosperity makes enthusiasm and enthusiasm produces success, and as we are in this war to win—there is no place of honor for the calamity howler.

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Transportation

Freight—Express—Motor Trucks

OF WHAT use are a million Americans in France if their food, clothing and supplies are stalled in the railroad terminals throughout the United States? They must be transported to the seaboard.

Transporting goods to feed, clothe and equip our nation, its navy, its armies and our allies, is the most colossal task we have ever faced.

Every transportation unit must be used to the limit—the motor truck has become as necessary as the railroad.

Use your motor trucks for city to city hauling; to bring produce from the farms to the towns; to deliver merchandise to the door of the user; to speed up the loading and unloading of railroad cars and ships —to facilitate every phase of transportation.

The whole world is relying on motor trucks to do efficient and speedy work.

But the truck itself cannot do it alone.

OFFICERS, EXECUTIVES, MANAGERS—the responsibility is yours. It is your patriotic duty to see to it personally that your delivery system is adequately equipped and efficiently supervised.

THE AUTOCAR COMPANY, Ardmore, Penna.

"THE AUTOCAR MOTOR TRUCK"

BOSTON PROVIDENCE NEW YORK NEWARK PHILADELPHIA BALTIMORE WASHINGTON PITTSBURGH CHICAGO SAN FRANCISCO LOS ANGELES SAN DIEGO